



CHEETAL

JOURNAL OF

The Wild Life Preservation Society of India

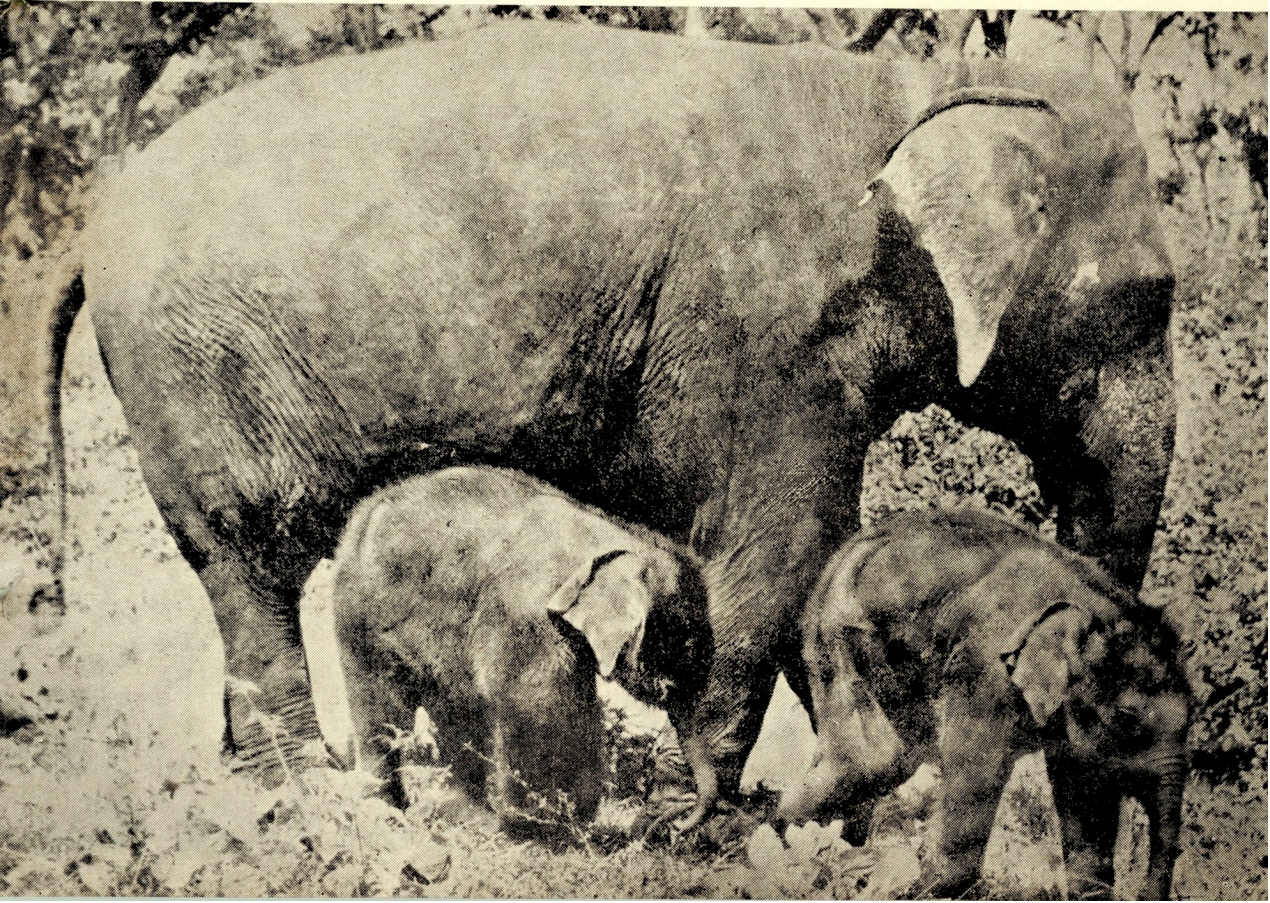
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FEMALE ELEPHANT WITH HER TWINS.

—Photo by the Chief Conservator of forests, Madras.



Wild Life Preservation Society of India

1. The aims and objects of the Society are as follows:—

- (a) To promote interest in and impart knowledge regarding the preservation and conservation of all forms of wild life, particularly among the youth of the country.
- (b) To co-operate with the Govts. of India and States and with other Societies and Institutions having similar aims and objects in working for the interests of wild life.
- (c) To assist in enforcing and actively supporting the Forest Acts, Wild Birds and Animals Protection Acts and Rules etc. of States and the Indian Arms Act and Rules in so far as they pertain to wild life and to bring to the notice of the authorities any infringement of the same and to assist in the detection and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wild life administrators in the formation, maintenance and protection of Sanctuaries and National Parks, the preservation of wild life in general and rare species of India in particular and in the introduction of exotic species into the country, the rehabilitation of rare species etc. and in the revision on rational lines of the shooting and fishing rules, so as to conserve and increase wild life stocks.
- (e) To raise funds for the carrying out of the above aims and objects and to found and maintain museums, reading rooms and libraries of natural history in order to disseminate knowledge regarding wild life.
- (f) To promote sportsmanship in shikar and to recognise well regulated shooting and fishing, as a means of preserving wild life and fish so that through wise use the surplus may provide a recreational asset to the nation.
- (g) To carry out publicity and propaganda for the preservation of wild life in India by means of monographs, journals, films, film strips and other feasible methods.
- (h) To assist members of the Society in obtaining shooting and fishing facilities and facilities for viewing and photographing wild life in India.
- (i) To conduct research into the problem of Wild Life management in India, and in pursuance of this, to initiate, encourage and, where possible assist in projects for the study of threatened species and related subjects and to provide reference and research facilities for such work.
- (j) To carry on such other activities which will serve the above subjects.

What membership of Wild Life Preservation Society of India will entitle you to ?

1. You will become an active member of the growing group of Wild Life enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of Wild Life for posterity.
2. You will be entitled to the full use of the Library of the Wild Life Preservation Society and of its reading room.
3. You will receive a membership certificate.
4. You will receive personal Identification and Membership card.
5. You will be entitled to buy all publications of the Society at a concessional rate.
6. You will be entitled to buy at concessional rates the Society's Greeting Cards, Calendars, Tie, Lapel badge and the Balance of Nature Game (specially Published in colour for its educative and recreational value).
7. You will be supplied "Cheetal", the quarterly journal of the Society free.

For membership particulars write to Honorary Secretary, Wild Life Preservation Society of India, 7 Astley Hall, Dehra Dun.

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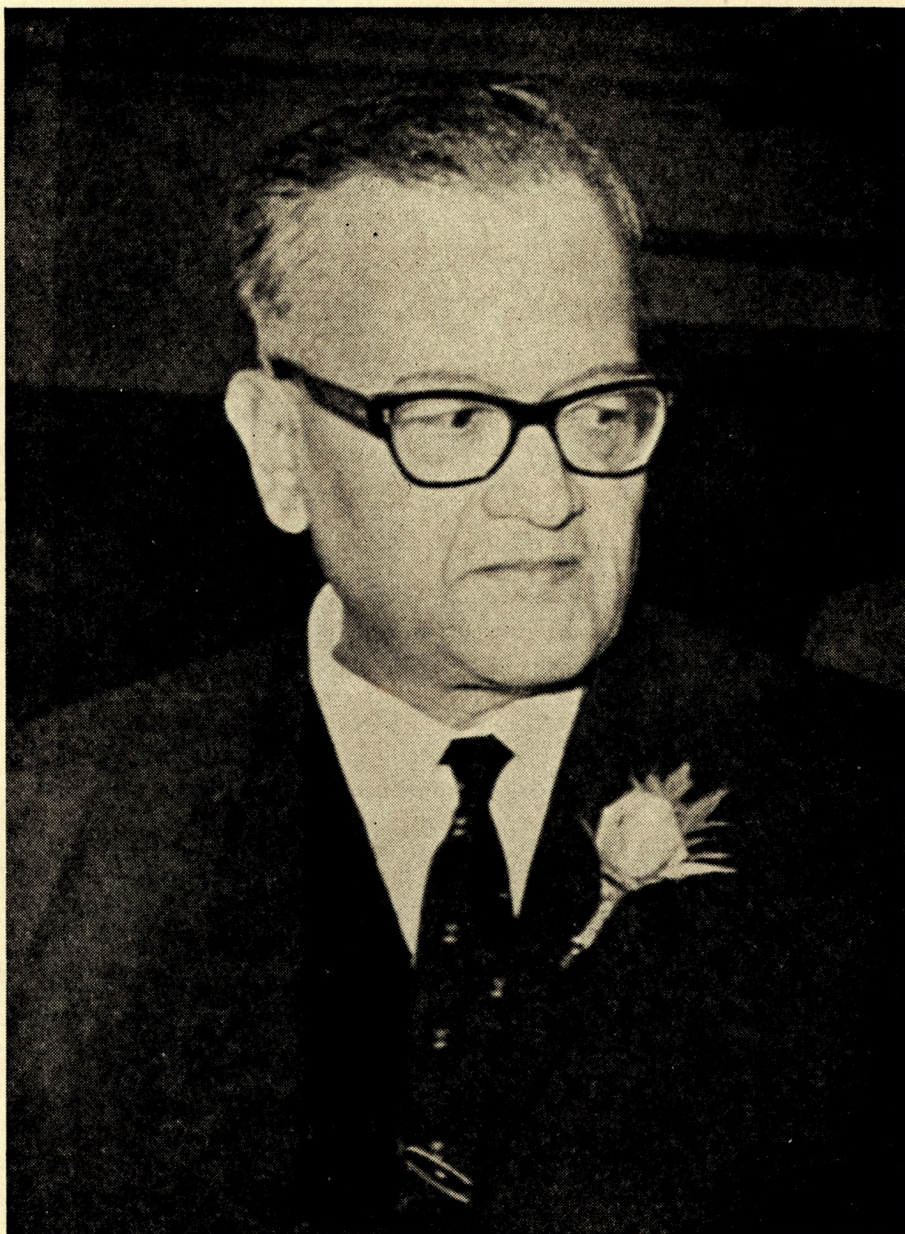
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Members and Subscribers are requested to note that all yearly subscriptions fall due on 1st of April each year. They are requested to pay in time so that Cheetal may be sent to them regularly.

Change of address should be intimated at the earliest to prevent Cheetal being lost in transit.

Honorary Secretary.

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THE LATE SHRI ADITYA NATH JHA

Obituary

DR. ADITYA NATH JHA

In the sudden demise of Dr. Aditya Nath Jha, on the 18th January, 1972, India lost a distinguished civil servant and the Wild Life Preservation Society of India, a valued patron and benefactor. Dr. Jha was 60 years old and the Lieutenant-Governor of the Union Territory of Delhi when death took him away, suddenly.

At the time of Dr. Jha's demise, glowing tributes were paid to him by the President of India, the Vice-President, the Prime Minister and a host of friends and admirers, for Dr. Jha had had a brilliant career and had contributed much to the welfare of the country. The citizens of Delhi, whom he had served for the last six years of his life, were deeply grieved at his sudden death, for they had felt the impact of his efficient administration; he helped make Delhi one of the really modern cities of India.

Dr. Jha was not only an able administrator and civil servant but a keen lover of the arts and a well-known exponent of Indian philosophy and culture. He took an active and prominent role in guiding the affairs of many social and cultural organisations, all over the country.

One of the Societies which benefitted greatly from the patronage given to it by Dr. Jha was the Wild Life Preservation Society of India, Dehra Dun. Because of his interest in Wild Life Conservation he readily agreed to become a Patron of the Society and guided it through some difficult times. Like many of his generation, Dr. Jha had witnessed the decimation of this country's wild life and no doubt, was greatly perturbed by it. It was through his personal efforts that the Society was given a recurring grant of Rs. 5000/- per annum by the Government of India,

to continue the publication of the CHEETAL, in the cause of Wild Life Conservation and we are now able to publish the Journal, quarterly instead of half-yearly. He was the moving spirit behind the formation of the Delhi Branch of the Society and generously donated money towards two annual prizes for the best articles in the CHEETAL, by any member and by any student member. The prizes were awarded for the first time this year.

The Wild Life Preservation Society of India and the country's wild life are deeply indebted to the late Dr. Jha for his patronage and condole with his family in their bereavement.

Wild Life In India

By

ARJAN SINGH

The decline in status of the wild life of India really stems from the demands which our exploding population is making not only on forest products, but on the forest land itself. Forests are essential for the economy of the country, for planned exploitation of its resources, as aids to precipitation during the seasonal rainfall, for prevention of erosion and leaching of the soil as an aftermath to periods of heavy rainfall, or drought and as a cyclic means of enriching the soil by humus deposits to foster timber growth. It has been recommended by various forestry commissions and foreign experts that forests should occupy one third of our land mass, but these prudent views are in the archives. For example Uttar Pradesh now has a mere 10% to 13% of its land area under forests and due to the advance of cultivation, no buffer zone of marginal lands exists between the forest land and agricultural holdings. Moreover a continuous process of erosion is taking place wherever increasing cultivation is encroaching on the forests themselves.

Inside the forests too, indigenous timber trees are being replaced by stunted exotics to step up the commercial returns, but with no concern for the long term concepts of forests management, and soil conservation. The results are climatic changes, and soil erosion and impoverishment, inducing a vicious demand cycle which must react to the detriment of future economy.

With the extension of cultivation towards the forests it has now become a question of survival of those species which are adaptable to the adverse conditions brought about in the forests. The black buck, the chinkaras and the Indian wolf to mention only a few, exist only in precarious survival pockets, and it depends on the success of the conservation movement as to how long we can assure their existence. The black buck originally transplanted from India to find an alternate home in Texas U.S.A. has now to be returned from viable population there, to attempt a resettlement in the country of its origin. We can but wish the World Wildlife Fund success. The swamp deer and the nilgai have made their last stand on the periphery of the forests. Their further retreat is limited by a hostile habitat, and their survival hangs in the balance. The lion huddles in desperate circumstances, fighting a losing battle for existence with 5000 maldharis and 50,000 cattle. For them the end is in sight. The cheetah has gone never to return.

The time has now come when we must ask the fateful question whether man has the right to abrogate to himself the privilege of sole existence? He has the power to do so, but if we jettison this ethical regard for the survival of the less favoured, but older creations in

our search for living space, is this process going to end with the disappearance of the last land mammal? It is not sufficient to say that while we have forests, the future of wild life is assured. When entire ecosystems are destroyed, and when wild life habitats are degraded to encourage quicker commercial returns, when the atmosphere of a closed habitat is vitiated by a money tag on every conceivable product, when human disturbance is universal, and the forest canopies resound with material quests, where is the animal to breed, and where is it to rear its young? The ubiquitous grazier sets to the herbaceous cover to encourage new grass shoots to nourish some of the 300 million cattle in India. Forest contractors continue their felling operations well into the rainy season, and their trucks carry not only timber, but carcasses of animals they may have waylaid, for the fluid law and order situation gives them an excuse to carry fire-arms ostensibly for self protection. The camp followers from whom the forest department earns a part of its revenue are the cattle graziers the honey gatherers, the scent manufacturers, the fishermen, the manure dealers, the hide merchants, the driftwood contractors, the firewood collectors, the monkey catchers, the thatch makers, and the plantation cultivators. It all adds up to a greater sylvan fiesta, but wild life cannot proliferate under these adverse circumstances. We are vitally concerned with the status of the spectacular tiger, but what of other endemic species, the leopard, the wild dog and the harijan of the forests, the striped hyena?

The forest department also has charge of the wild life organisation for which there is no separate recruitment and a continual two way traffic exists to the detriment of the organisation as the promotional prospects are with the parent department. As a result unwanted and substandard personnel usually get posted to the wild life wing where promotional prospects are poor. Moreover even dedicated officers are encouraged to return to the parent department as it is maintained that they loose touch with forestry problems. The converse charge that they will loose touch with wild life problems is not even considered, and consequently is no interest. Wild life concepts the world over have changed, and wild life in the present day context of intensive planning is a specialist subject, but here our pundits of the forest department are ipso facto by association deemed to be experts in matters pertaining to wild life. The impact of destruction, degradation and exploitation of habitat is not considered, and the officer incumbents of the organisation function as glorified chowkidars, while the subordinate staff listlessly pass their time without promise of promotion or reward, until such occasion as they make profitable contact with the poacher.

The forest department claims to be a commercial organisation and all their efforts are towards increasing revenues. It is a fact that though a tree cannot die in peace without a rupee value being assigned to it, internal money allotments for the building of fair weather roads and bridges are so absurd, pertaining as they do to times when the money value was much higher, that much of the work never gets done. Heavy cattle grazing and timber exploitation takes place in Parks and Sanctuaries with the resultant effect on wild life reproduction. Every measure which might be beneficial to wild life is first examined in the

context of its impact on forestry principles and allied ramifications. For instance, the cattle grazing problem in a particular area is examined as to whether an alternative grazing area can be allotted, rather than from the extent of damage to forest growth though cattle are now found everywhere in the forest. Wild life is still treated as a bonus privilege of shikar days, though the where-withal has vanished.

This clash of interests must take place, and when mutually antegenistic activities are run by the same department, it is obvious that the weightage in an underdeveloped country must be on the commercial aspect. I am not blaming the personnel of the forest department. They are largely an able, efficient and dedicated group when dealing with forestry matters, but by training and equipment they are not qualified to hold the dual charge of wild life. Wild life tourism earnings will be gauged on an overall basis and to equate it on a profit and loss account with forestry taking is wrong. But the writing is on the wall and time is running out. We must face it now. It is a great service to serve dumb creatures, for there is no material reward. The ecological balance in natural species is one that in normal circumstances would be between predators and prey animals, and is one of mutual interdependence, where the predator functions not to the detriment of wild life but is an integral and valuable part of it. It may sound paradoxical but with no limitation on predators, they would increase to the extent that they would destroy the prey species. However, this it not so, and the carnivore population is self-limiting in relation to its density, the available prey, and the territory into which it can expand. The normal territory of a tiger is about 30 sq. miles, and that of the tigress is somewhat less. This territory may be visited by transients from neighbouring territories, with whom a definite tolerance order exists, but is regularly maintained only by the resident male and/or female, who may demarcate their territory by scent spraying by defaecation and by vocalisations. The second limiting factor is the period of juvenile dependence. Though the period of gestation is short 14-16 weeks for a tiger and about 12 weeks for a leopard, the cubs are with their mother for approximately two years. The normal litter is usually from one to three, but the carnivores make poor mothers, mainly due to the stress of hunting. Cubs may be consumed with the after-birth, and moreover are subject to lung and intestinal ailments. The mother may be absent for long spells and accidents occur, with the result that only an estimated 50% of the progeny survive. The cubs on attaining maturity will move out to seek fresh territory or become wanderers until they can establish a territory of their own. In case of high density populations, mortality may occur at altercations over kills, or during competition for mates.

Herd animals are however not inhibited by territorial limitations, and though the gestation period of most of our wild ungulates is from 7-9 months, survival rates are more favourable due to parental care and hardier young. Breeding takes place annually and two fawns are frequently dropped. Increase rates are therefore more prolific, as they must be in order to maintain a favourable balance inspite of predation.

The dependence of the predator on the prey species is obvious, but the benefits of predation are more obscure. Carnivores usually prey on stragglers, which are either heavily horned stags who are past their breeding prime but remain dominant due to size or are sick and old animals. The herds are therefore kept revitalized. Deer moreover are very insular in their grazing habits, and tend to confine themselves to limited areas. Not only is there a danger of overgrazing, but an epidemic may drastically affect a heavily localised population and the presence of predators serve to keep them alert and on the move. And finally an excessively favourable reproduction rate may again lead to heavy over-grazing and degradation of habitat.

Predation in wilderness areas does not follow a pattern, and requirements based on zoo figures are unreal, except as a basis for estimates. The verdict of hunters that a tiger kills twice a week is simplifying a quest in which the carnivores often fail to get their quarry. It is not possible to gauge the proportion of failures of a tigers stalk, without modern radio telemetric attachments but what is certain is that they are heavily disproportionate to the successes. One of Schaller's lions in the Serengeti fed 7 times in 21 days and each meal was scavenged from a lesser predator. Only once did the lion chase a 10 lb. dikdik without success. In my estimation a week or ten days will sometimes go by without a tiger making a kill. The feast or famine regimen however seems to suit the metabolism of the free ranging carnivore. It may be possible to recycle the body protein in times of scarcity as is done by some deer on poor ranges. A tiger's intake can be prodigious and a 500 lb. buffalo may be consumed in three days. A wild pig weighing about 200 lbs. was eaten except for the head in a night. The same tiger killed a buffalo and abandoned it after feeding one night. He returned ten days later to finish a putrescent carcass during which time it was presumed he had not killed. The question is often asked if the tiger is a humane killer? He is not and one cannot ascribe such a quality to an animal, but he is an exceedingly efficient killer, and I would personally far rather be killed by tiger than die to the threefold invocation of God's bounty and the ministrations of a blunt knife. True a tigress may disable an animal, when teaching her siblings how to kill, but though comparisons are odious, many a bird is purposely winged at Field Trials, for the testing of trained gun dogs. It was a tiger of my acquaintance who gnawed a bone in full view of a tied live bait, but did not kill it because he was not hungry.

The invasion of the forest by much of India's 300 million cattle is probably the largest single factor which has disturbed the ecological balance of the forests. Before 1947 the Forest Working Plan laid down specific areas where cattle could graze—it still does—and their incursion into close canopy and plantation areas was forbidden. But now they are everywhere, with the graziers setting fire to wild life habitats and forest plantations with cheerful impartiality in their search for newer pastures. They are said to compete with wild ungulates for grazing areas, but that is the wrong word. Wild life moves but when cattle

take over the range, and the former get dangerously exposed to cattle borne diseases in the meantime. It is also said that cattle provide prey for carnivores in areas where wild species are scarce, and one would expect to find tigers and leopards that live entirely on cattle. But this does not work out in practice on a long term basis. Uttar Pradesh and Madhya Pradesh have extensive areas of tiger habitat with large herds of prey animals in the shape of cattle, but no tigers. Tigers have a definite preference for wild prey species, which in any case are a better source of protein, and it is only carnivores well past their prime, or incapacitated in some way that become inveterate cattle feeders for some time. Even then, the human association forces them to seek alternative subsistence on carrion, birds, fish, frogs and even molluscs, until the inexorable process of nature removes them from the commity of forest dwellers, unless they are branded in their own homes as cattle lifters at the behest of the voting public.

Human predation continues unabated. The fur trade is still rampant in spite of export bans. Game birds are served at all restaurants in big cities during close periods, animal and bird markets flourish under inhuman and deplorable conditions, and rare and endangered species are sold at exorbitant rates. But what is ominous is the attitude of the States to the tiger ban. The moratorium on tiger hunting was recommended for an initial five year period by the IUCN, (the International authority on all wild life schemes), until such time as a population census denoted favourable trends. This measure was endorsed by the Indian Board for Wild Life, and the Prime Minister was personally interested enough to ensure that Central legislation was favourable.

Wild life is unfortunately a State subject and before the IUCN meeting in November 1969 a so called State census of tigers was conducted. The figures were unreliable, culled as they were, from reports of such untrained and irresponsible subordinate staff as forest guards, wild life guards, firewatchers and graziers. The Shikar outfitters who maintain that there is a plentiful supply of tigers offered their co-operation, but no conservationist was called upon to assist. Uttar Pradesh presented a total of 500 tigers and by an adroit manipulation of figures, professed itself in favour of controlled shooting. Madhya Pradesh produced a fluid population of 600-1400 and expressed itself not in favour of the ban. The centre however holds the trump card in export control, and the States reluctantly imposed bans varying from 2 to 5 years. However Charan Singh before his departure from the Chief Ministership of Uttar Pradesh set the pace, and was induced by the Shikar Outfitters to cancel the ban, and it was only a wise Governor who on the advice of his erstwhile Forest Minister cancelled the infructuous order. While maintaining that census figures are inflated, I consider that an ominous portent which has emerged, is that males seem to predominate in the count. This imbalance will lead to serious consequences, as failing a 2:1 ratio, a definite female preponderance is essential. States who have taken the bit between their teeth would be wise to ponder the cause (Madhya Pradesh have reopened tiger hunting to

foreign clients*, a singularly defiant step considering the strongly expressed view of the International Body, their willingness to sponsor a preliminary All-India census, and the recommendation of the Central Government). The Central Government ban on exports of skins still holds good, and it is to be seen how the aberrant state authorities deal with this legal hurdle. Mounted skins are obtainable in Furrier shops who maintain that foreign tourists are permitted to take out one skin. It is a sordid tussle especially when other countries are so concerned.

The years ahead are very critical. In an increasingly socialistic pattern of society it is only Government legislation which can save wild life, yet it is an anomalous fact that it is individual dedication and enterprise which can show the way. Unless wild life can display a commercial potential no one is going to care whether the rest of our species is written off, least of all the commercial hunters. Tourism is a nebulous concept not to be quoted with the straight forward profit and loss account of a business venture. Profits from wild life viewing may not be spectacular, but the cumulative spending of the tourist transcends all business profits. Because of its diffuse impact it is harder to project as a viable scheme, and with the myriad problems facing the country individual priorities get lost.

Tourism must remain a long term prospect, but unless the wild life organisation becomes separated from the Forest Department all is lost. Wild life will not last much more than a decade under present priorities, and this is not the verdict of a prophet of doom, but the thinking of an increasing number concerned with conservation, pollution, and the future of mankind. Parks and Sanctuaries comprise 2.3% of our forest areas, and unless this infinitesimal percentage can be ceded from the Departmental empires in the interest of future generations, and given over to a free and dedicated service all hope is ended. Game farms are a concept of the future, but so are wild life deserts.

*The ban was re-imposed a year later.—Editor

World Exhibition of Hunting, Budapest (Hungary) 1971

BY

C.L. BHATIA

When the Hungarian Government thought of holding the World Exhibition of Hunting, they wanted it to be entirely different from previous similar exhibitions. Hunting Exhibitions have an old tradition in Hungary and there have been many trophy shows and competitions during the past ninety years. In this Exhibition, the main theme was the relationship between man and nature. In the centre of the Exhibition grounds was Man of the modern age and thus the exhibition was to serve the better knowledge of nature, the preservation of cultural treasures, the promotion of true hunting customs and hunting traditions, the propagation of knowledge and experience of up-to-date game management and to demonstrate its economic significance. Both its well-developed game management and hunting culture enabled Hungary to undertake the organisation of the World Exhibition of Hunting. This was the first in the series of international hunting exhibitions indicated in the list of officially acknowledged international exhibitions and which had the rank of a world exhibition. When the Hungarian Government got the approval of the International Council of Hunting and the International Angling Association to hold the World Hunting Exhibition, it was registered in the category of "Special Exhibitions" by the Executive Council of the International Bureau of Exhibitions. The Government of the People's Republic of Hungary thereupon made all-out efforts to provide the best conditions for the organisation and arrangements of the Exhibition. The main idea was to provide both, an all embracing view of hunting in the world, game management and angling and a forum to exchange experiences for the benefit of hunting and game protection all over the world. The exhibition was arranged so as to display a comprehensive summary so that even a layman would become an active supporter of scientific game management.

Hunting traditions in Hungary date back to the very beginning of their history. In 1157 salt-licks were set up for the deer in the forests. Game Parks were set up in the 13th Century and in the 16th Century laws were passed on game protection, hunting seasons, regulation of hunting rights.

The Hungarian hunting culture which is regarded as unique in Europe, had a great influence on game management. New species of game were introduced and wild life multiplied manifold. In the later part of the 18th Century some decline was noted in the hunting ethics and hunting culture and therefore, at first the hunting law of 1872 and later that of 1883 was decreed. This presented a turning point as far as hunting in Hungary was concerned. In the wake of this law the stocks of small game gradually increased, the quality of red deer improved, roe deer became numerous. All this alluded to a regulated game management.

The Second World War, however, caused immense devastation of the game stock in Hungary. After the War, the Government introduced effective measures for game management in order to save and develop whatever was left. Certain species were declared partially or completely protected and their numbers started increasing steadily. The special conditions of various biotopes were emphasised in evolving modern techniques of game management. The hunters in Hungary are busy in looking after and protecting game stock. Scientific institutions and State authorities together have made game management a purposeful economic activity which transforms game management into a branch of the national economy. These activities—the well planned breeding of game, its increase both in quality and quantity, the keeping down of vermin, the regulation of game stocks – assume a special importance in modern agricultural development.

Hungary can, therefore, be taken as an example of game management well directed and regulated by laws based on scientific research work and carried out with high professional skill. The methods applied solve all questions on a regional basis, considering the conditions of the various natural biotopes as well as the requirements of an extensive exploitation.

During the past 25 years the afforested area in Hungary increased from 12.1% to 16% and this was also favourable for wild life.

The Wild Life Management Department of Hungary keeps accurate records of the number and quality of game stocks. Concerning the nearly 2000 fallow deer and 3000 moufflons, the aim is to increase their stocks. Roe deer have increased to more than 1,00,000 already. Their number has to be reduced in order to maintain good quality. The number of pheasants reached a pre-war level, aided by artificial breeding. The number of partridges too, surpassed half a million but even so it has not yet attained half of the pre-war numbers. Hares are increasing so rapidly that their number has to be reduced especially in regions with intensive fruit and vine-culture.

In Hungary, the professional conditions for wild life management have fully evolved. By a purposeful utilisation of Hungary's favourable climate and soil conditions, Hungarian wild life experts and game wardens have succeeded in developing a game stock which can be considered as world famous not only in their numbers but also in the quality of capital trophies. This was not achieved by chance, but was the result of a well directed and practised, far-sighted game management carried out for decades. It is this regulation of game stocks, selective shooting, and the planned improvement of ecological conditions of game, that make Hungarians proud of their achievements.

It is no wonder, therefore, that Hungary was and is still considered a wild life paradise by the foreigners. Every year, about six million tourists visit Hungary (the population of Hungary is only ten million). The Government of Hungarian People's Republic confidently

say "that soon the tourists will out-number the Hungarians". What does Hungary offer to its six million tourists—hot spas, gypsy music, good food and most important of all beautiful forests full of wild life. The Hungarians earn millions of dollars in foreign exchange from the tourists who come and visit their 300 sanctuaries; quite a large number for a small country with an area of 35,919 sq. miles.

"Preserve everything that is Hungarian", King Stephen advised his son in an early document "and do not forget that without a past a nation has no future".

How true ! Wild life is a National asset—an inheritance—and it is the duty of the present generation to pass it on unimpaired to posterity and let us do it the Hungarian way without losing any time.

By participation in the World Exhibition of Hunting, India has learnt a lot about wild life conservation. She has also shown to the world her concern about the preservation of nature. This is the first time that India had taken part in an exhibition where the theme was "plenty through preservation". India did not participate in the previous hunting exhibitions held in Vienna (1910), in Leipzig (1930), in Berlin (1937), in Dusseldorf (1954), in Florence (1960) and in Novisad (1967) but Hungary was always present. The great strides which Hungary has made in wild life preservation may be attributed to their participation in these Hunting exhibitions.

The Indian Pavilion which had been given an oriental touch was decorated with exhibits consisting of a cross section of themes connected with wild life; unlike other Pavilions, which comprised mostly of trophies.

The President of the Hungarian People's Republic who inaugurated the Exhibition on the morning of 27th August, 1971, paid a visit to the Indian Pavilion soon after the inauguration and appreciated it very much. The Indian Pavilion with its live exhibits, trophies and the finished products of wild life, which had no parallel in their beauty, delicacy and splendour, aroused attraction. Visitors to the Indian Pavilion who came in large numbers throughout the duration of the Exhibition, enjoyed the objectives of art, the magnificent white tiger, the dainty birds, the call and acrobatics of the Hoolock Gibbon and a host of other exhibits which covered a wide range of themes connected with wild life. There were numerous queries, both technical and of a general nature, which were answered by the officers attending the visitors. The visitors carried with them a glimpse of the wild life and the various places of tourist interest in India which is bound to promote the tourist traffic to our country. About two million people from Hungary and other European countries visited the Indian Pavilion.

Selected exhibits like the head of the mighty gaur, exquisite ivory carving and filigree work in silver, antique muskets etc. decorated the space allotted to India in the Great Hall, variety inside the Indian Pavilion.

Although the exhibits arrived late, the special Jury appointed by the Exhibition authorities made a concession to India by permitting trophies to enter the trophy competition. It is a matter of pride that four out of the five trophies presented by us to the Jury won prizes of which three were gold medals and one was a silver medal. The only trophy which did not win a prize, was awarded a Certificate of Merit.

Four Indian films had been sent for the World Competition of Nature Films of which three were selected for the competition. Two of the three films exhibited won great applause from the audience and won bronze medals. These were:—

- (i) Kheda in Mysore by Shri K.N.S. Sastry:
- (ii) Ananta—produced by Shri Girish Vaidya for the Films Division in the Ministry of Information and Broadcasting.

Enquiries had started pouring in at Budapest from various European countries, for purchase of these films and also to visit India for location shooting of Nature Films.

Some 16 mm films on Nature Conservation and Wild Life were projected during the evenings to educate the public on the glory of India and its wild life. Selected Indian classical vocal and instrumental music was played most of the time inside the Indian Pavilion to give it an oriental atmosphere.

In addition to the Hungarian President other distinguished visitors including the Prime Minister, Vice-Premier, Minister and Deputy Minister for Agriculture of the Hungarian People's Republic, and a large number of visitors from all over the world recorded their appreciations of the Pavilion and the efforts made to project the wild animals and birds of India, their variety and efforts being made to conserve them.

It is a matter of great pride for India that she was given the highest importance in the activities of the World Exhibition. India was one of the four members on the panel of the Council set up to represent the 51 participant nations other than the host country. India was also one of the twelve members of the Jury for the International Nature Film Festival and was invited to the Presidium when the famous writer Joy Adamson addressed a selected gathering at a special function. India also received many invitations from various countries to visit them so as to advise them on zoos and National Parks.

India's participation in the World Exhibition of Hunting has publicised the wild life of the country to nearly two million people who visited the exhibition during these five weeks and this is bound to promote a sense of friendship, understanding and co-operation in all the participating and visiting countries.

Wild Life Tourism has greatly developed in Hungary. Not only does wild life attract tourists in steadily increasing numbers but also the well organised safari trips, the high

standard of accommodation in rest houses which are situated far from the turbulence of daily life where foreign guests enjoy the famous Hungarian hospitality, and find rest. Yet beyond all that, wild life tourism advances understanding and mutual respect amongst different nations.

Let us therefore, save our vanishing wild life. We should concentrate on wild life tourism. We must have more sanctuaries and National Parks and an effective game management agency which must take adequate steps to preserve wild life so that the flight and song of wild birds and roars of our tigers and other animals will continue to up-lift the hearts of man.

References:

Hungarian Album of Hunting.

CENTRAL BAN ON WILD LIFE.

Calcutta April 27. (U.N.I.)—Prime Minister Mrs. Indira Gandhi has informed all Chief Ministers that Centre will enact a legislation for protection of wildlife in the country.

In individual letters to Chief Ministers, Mrs. Gandhi has asked them to adopt a resolution in the State Assembly to enact a legislation for the protection of wildlife.

It has been suggested that the Centre and States in concert set a resolution passed for the protection of wildlife under Article 252 (i) of the Indian Constitution.

Winter Track Census Survey of Wildlife of Palamau National Park

J. MISHRA, I.F.S.

DEPUTY CONSERVATOR OF FORESTS

The Winter Track Census of Wildlife in Palamau National Park was carried out on the 7th January, 1972. It is hoped to carry out a similar Winter Track Census survey on the 7th January every year unless due to heavy rains or other adverse factors it would be impossible to do so. Comparability in weather conditions to that of other years would be maintained as far as possible. The highlight of this survey was that Shri S.P. Shahi, Chief Conservator of Forests, Bihar participated in it and was one of the track leaders in Betla Census Block. An A.C.F. attached to this Division and the Assistant Game Warden of Hazaribagh National Park also acted as leaders in the same block. This greatly enhanced the authenticity of the count and also infused greater encouragement in the staff employed in the operation.

Preparation of the Tracks

Palamau National Park, covering about 250 sq. kms consists of five census blocks. In each block we had the parallel census strips laid out on the ground at a distance of about 400 yards with the help of the Prismatic Compass. These strips had been laid out for the previous census operations. The old rings on the trees falling on the lines were freshened and the bushes cleared to show the direction of the strips running across the forests. The track lines are numbered on the ground so that leaders do not find it difficult to locate their lines. The track lines, 147 in number, were as follows:—

Name of census block		Total No. of tracks
1. Betla	...	30
2. Chhipadohar	...	40
3. Harnamar	...	23
4. Mundu	...	28
5. Haratu	...	26
		Total :— 147

Condition at the Time of Survey

It was a bright sunny and chilly morning. The dry grass was covered with a layer of thin frost. There was light wind too, which enhanced the cold. The work of the coupe lessees in the entire National Park, was stopped with effect from 5th January, 1972. The visitors to Betla were also persuaded not to visit the Park. It was a matter of great

satisfaction that they co-operated fully. The conditions, except for the chilly morning, remained almost identical to that of last year.

Constitution of Census Parties

As usual 147 parties were formed, each consisting of a leader and a follower. As mentioned earlier, one of the census parties was headed by the Chief Conservator of Forests, Bihar, another by the A.C.F., and still another by the Asstt. Game Warden of Hazaribagh National Park. Endeavours were made to use only Forest staff as the leader of each census party, but the number of staff available was the limiting factor. The following table gives the number of Tracks, Parties and Track leaders:—

Sl. No.	Name of census block	No. of Tracks	No. of parties.	Track leaders
1.	Betla	30	30	28 staff — 2 outsiders
2.	Chhipadohar	40	40	18 „ — 22 „
3.	Harnamar	23	23	9 „ — 14 „
4.	Mundu	28	28	27 „ — 1 „
5.	Haratu	26	26	26 „ no outsider
		<u>147</u>	<u>147</u>	<u>108</u> 39

Thus in all the 147 tracks, 108 tracks were headed by forest staff and in 39 tracks, literate village headmen acted as leaders of the parties. Three extra parties for each census block, were kept ready as 'reserves' but the necessity to use them did not arise. All the 147 track census parties had to observe the following instructions:—

- (1) Each census party consisted of two men, a leader and a follower.
- (2) Each party was supplied with a printed form to record the animals enumerated.
- (3) The parties reached their starting point by 6.45 A.M.
- (4) The parties started moving noiselessly on the tracks by exactly 7 A.M.
- (5) Animals whether seen singly or in groups were to be recorded. Similarly their sex and age groups viz. male, female, adult, yearling or fawn,
- (6) Only fresh pug marks of tigers were to be taken note of and their dimensions recorded.

Before the actual day of census, the following steps were taken:—

- (a) All the departmental works and all operations in the forests throughout the National Park were stopped from 5th to 7th January, 1972.
- (b) No domestic cattle were allowed to enter the forests before 11 A.M. on the 7th January.

- (c) All pug marks of tigers were obliterated.
- (d) Visitors to National Park were persuaded not to move in the park during the morning hours from the 5th to 7th January.

Expenditure Incurred

The following expenditure was incurred on the clearing of track lines and on wages of the track leaders and followers:—

1. Clearance and freshing of the ring marks on trees of track lines	Rs. 900/-
2. Payment of wages.	Rs. 400/-
	Total Rs. 1,300/-

Track Census Works

The track census survey started exactly at 7 A.M. on the 7th January, 1972 and as per schedule, ended at 10 A.M. By the evening of the same day, the entire census papers of 147 tracks were in hand.

Processing of the Count

Each individual track census paper was thoroughly examined and checked. To avoid duplication, every consecutive track was compared in great detail. It is a matter of great satisfaction that with the experience gained, the probability of duplication was also being reduced. This is because greater details of the movement of animals are being maintained in the track census papers. The census paper of Betla and Mundu blocks were accurately recorded. No duplication could be found. The trackers had gained experience by studying the behaviours of animals in the field. Some interesting examples are noted below:—

In Haratu census block on track No. 8 one sambhar stag ran from the right to the right of the track at about 8.30 A.M. and between 4 to 5 kms. on the strip. The leader of track No. 9 also saw a sambhar stag running from right to the left of the track at the end of the 4 kms. strip at 9 A.M. Obviously these were not the same animal as the stag of the track No. 8 could not run to the right of track no. 9 and again get back towards left. The time and distance also differ.

Again in Haratu Block, a male barking deer was noticed on track no. 15 at the start of the census which ran towards track no. 16. The leader of track no. 16 also saw a barking deer (male) at the beginning of the census which ran back towards track no. 15. Thus it was the same barking deer which was noticed by both parties. Hence the record of the barking deer on track no. 15 was expunged.

In Chhipadohar block, five spotted deer: one male, 3 females and a yearling were noticed by the leader of track no. 1 at about $1\frac{1}{2}$ km. from the starting point which ran towards the right of the trackers. The track leader of track no. 2 saw the same number of

spotted deer almost at the same distance. These were on the left of the track and also ran towards the left. There is every probability that both the leaders saw the same herd and hence to avoid duplication, this number of spotted deer recorded by the party on track no. 2 has been expunged.

Again in Chhipadohar Block, fresh pug marks of tiger were seen by the trackers on track no. 24. Track no. 25 is not adjacent to track no. 24. They are quite apart. There is every possibility of a tiger and tigress being together because this was the mating season. Hence the figure of a tiger recorded by both the track parties has been accepted.

Similarly in Betla block, two tigers—a tiger and a tigress—were seen on 4th night, and 5th morning and evening. There was a kill on the 5th evening and signs of the tigers lurking round the remains of the kill on 7th morning, were also observed. Fresh pug marks of both the male and female tigers were found in the nala to the left of track no. 9. Hence these have been accepted.

The data was carefully scrutinised. This was the third Winter Track Census of the National Park.

The following table gives a comparison of the three surveys:—

<i>Species</i>	<i>1970</i>	<i>1971</i>	<i>1972</i>
1. Tiger	12	14	6
2. Leopard	1	4	1
3. Hyaena	2	3	4
4. Wolf	12	1	4
5. Wild dog	—	9	—
6. Elephant	—	6	17
7. Gaur	61	81	53
8. Sambhar	139	148	125
9. Blue bull	7	14	15
10. Cheetal	597	625	541
11. Barking deer	62	95	67
12. Wild boar	263	333	251
13. Bear	2	7	1
14. Peacock	123	218	182
15. Porcupine	—	5	—

A cursory glance at the table gives an indication that the figures of almost all species have come down in the year 1972. As mentioned earlier in this report the 7th morning was very chilly, it may be that all the animals had not started moving due to the intense cold and they still required the forest cover for protection against cold. Visibility was also slightly poorer than other years as we had higher rainfall this rainy season and so the atmosphere was damper. Even teak trees had not shed their leaves when in other years they were mostly leafless at this time of the year.

Elephants which are voracious eaters, were on the move and all of them in Betla block were counted. Most of the elephants this year could not come into Betla due to the check applied by us. Some of them are across the River Koel in Chainpur areas and in Baresand Block.

Sex Ratio

The following are figures for different age groups of spotted deer. For comparison, last year's figures are also mentioned.

<i>Year</i>	<i>Male</i>	<i>Female</i>	<i>Yearlings</i>	<i>Fawn</i>	<i>Total</i>
1971	179	341	75	30	625
1972	167	275	75	24	541

If 50% of the fawn and yearlings were males, then total number of males becomes 231 and that of female 394 for 1971 and for 1972 the number of males 216 and that of females, 325. In 1971 the sex ratio (male : female) is $1:1\frac{1}{2}$ (slightly leaning towards the female). But for 1972 it is almost correct to $1:1\frac{1}{2}$. The ratio of female to yearling and female to fawn seems to be unbalanced. Even if 50% of the females are taken as barren, at least there should be 170 yearlings and 170 fawns. It may therefore be surmised that the movements of yearlings and fawns are not as regular as that of the males and females.

Tiger Census Count

It would be of interest to examine separately the track census figures for tigers last year, out of 147 tracks, tigers were either seen or their fresh pug marks recorded on 19 tracks. The tracks were nos. 1, 2 and 20 of Harnamar block, track nos. 21, 23, 24, 25, 29 of Chhipadohar block, track nos. 8, 23 and 28 of Mundu block, and track nos. 6 and 13 of Betla block. Tigers were actually seen on track nos. 21, 25, and 29 of Chhipadohar block, and track nos. 23 and 28 of Mundu block. On the rest of the tracks only pug marks were seen.

In the 1972 Winter Census, tigers were seen only on track no. 21 of Chhipadohar block and on the rest of the tracks only pug marks were seen. Two tigers—a male and a female—had been seen in Betla block on the 4th evening, 5th morning and evening. Their presence was also recorded between track nos. 8 and 9 during the census period. This year they have been seen or their pug marks recorded on track lines quite apart from one

another, hence none of the figures of the census papers have been expunged. The following table gives the details of the track nos. on which either a tiger had actually been seen or their pug marks located.

<i>Census Block</i>	<i>Seen</i>	<i>Fresh pug marks</i>	<i>Remarks</i>
Betla	—	Track No. 9	Two fresh pug marks one of male and the other of female. Due to mating season, both are moving together.
Chhipadohar	Track no. 21 (Pug mark could not be traced)	—	—
Harnamar	—	Track no. 8 7" × 6"	Probably a male.
Haratu	—	Track no. 2 8" × 7"	The first one is male and the other is a female. As the mating season is on, both may be moving together.
		Track no. 4 5" × 5"	

It would be thus seen that after careful scrutiny a total of six tigers (4 males and 2 females) were spotted in the Track Census Survey in the entire National Park. The number arrived at though less than previous years does not mean that they have moved to other areas. Actually a tiger whose presence is always known by its movement and kill in Mundu block could not be located. In Betla itself, two tigers could not be seen in spite of their presence between track no. 8 and 9. It was just possible that their movements could not be located, for want of fresh pug marks on the track lines. It appears that this method is not probably suitable for the count of carnivores. This shall be confirmed after more experience.

Conservation of Swamp Deer (*Cervus Duvauceli Branderi*) in Kanha National Park, Madhya Pradesh

By
H.P. AGRAWAL

India can boast of a rich fauna which is both varied and spectacular. Nature has so blessed it that no matter where one is, our country's beautiful birds and animals are not far from us.

Some of the Indian big game species are rapidly declining and are on the verge of extinction. The Red Data Book of the I.U.C.N., edited by Noel Simon, lists about 17 species as 'endangered' within or near about Indian confines. One of them, the Swamp deer or Barasingha, *Cervus duvauceli branderi* of Madhya Pradesh is in some danger of extinction. The surviving population in Central India is restricted only to Kanha National Park in Mandla District.

It should be realized that the remnants of this sub-species and the wild areas which they inhabit are a priceless economic asset as well as a vital resource in terms of human welfare. At least a sufficient number of this animal, and its natural environments should be saved as a gauge against which to measure man's irreversible changes and to appraise their consequences. India's big game species have existed for untold centuries. Why not let them exist for a few more?

In Kanha National Park the Swamp deer numbered about 3,000 in the year 1938 and in 1965 it was reduced to 109 individuals. To-day its number has further reduced to about 65 individuals only. Under the circumstances, the author feels it necessary to discuss how this species can be saved from extinction in Kanha National Park and what steps can be taken to increase its population? The protection of Swamp deer involves a number of complex scientific problems but it is essential to find a way to save this sub-species, before it is too late.

Before mentioning the exact problem, it is necessary to give in brief some information about Kanha National Park also.

The Banjar game reserve in Madhya Pradesh, covering an area of nearly 250 square kilometres, was declared a sanctuary in 1935. It was created a National Park in 1955. It is situated between latitude 20° 10' to 22° 20' N. and longitude 80° 30' and 80° 45' E. in Mandla district of Madhya Pradesh. The approximate elevation of area varies from above 2750' (840 metres) in the south-east and below 1750' (535 metres) in the North-west. The average rainfall is about 125 cm. The maximum temperature in the shade is about 40°C

(mean 21°C., in hot season) and minimum is 4.5°C. The landscape and the valleys are open and free with belts and islands of sal trees. The Kanha Forest Rest House, 72 km. from Mandla, is situated in the heart of the park, which has been noted as a sportsman's paradise since long. The park abounds in very rich and varied fauna such as the cheetal, the swamp deer, the black buck, the sambar, the blue bull and the bison. There are also the tiger, the panther, the wild dog and the hyaena. The bird life is rich and varied including the wild fowl, the quail, the pigeon and visiting ducks.

Though the species endangered need special studies to devise techniques for their survival, I give below some urgently needed specific suggestions and the reasons why Swamp deer is endangered in Kanha National Park. The factors that can be taken into consideration for the conservation of Swamp deer (*Barasingha*) or to increase its sinking population are given below.

1. Environmental Factors

- A. *Habitat deficiencies*:—
 - (i) Food.
 - (ii) Shelter.
- B. *Physical agencies*:—
 - (i) Weather conditions.
 - (ii) Man's activities.
- C. *Biotic agencies*:—
 - (i) Disease and parasites.
 - (ii) Predators.

2. Species Factors

- A. Habit of the species.
- B. Capacity to reproduce.

The disappearance of the sub-species; i.e., *Cervus duvauceli branderi* is seldom due to physical obliteration. It is the more insidious factors of destruction and disturbance of habitat and breeding grounds, and shortening of food supply which has the ultimate impact. In the beginning of this century the forests were so deep and dense that one had to hack his way to pass through them. To-day, the forests are considerably open and are becoming almost grasslands. With the cutting down of the forests, the availability of water has also been affected. The ground vegetation has also decreased. What is more, place for breeding is restricted as their minimum requirement of a shallow scrape in dense undergrowth, lined with dry leaves, is no more available. All this shows that modern man has made an ecological nuisance of himself. The forests need once again to be rejuvenated and conserved. The conservation of forest is an essential pre-requisite for the conservation of the sub-species.

Nature keeps up the optimum population of a wild animals community in a particular habitat with the limiting factors of food, water, shelter, enemies, and disease. If there is adequate fodder and protection, swamp deer increase in number and forage the forest and hasten the scarcity of fodder.

Before deforestation, it is imperative that the species should get some alternative adjacent forest or suitable habitat so that they may move over to these areas. Hence, if the habitat deficiencies can be made up, i.e., food and shelter, there is a ray of hope that the species can survive.

The forestry measures generally adopted to protect wild animals are protection of forests by preservation of shade and fruit bearing trees and shrubs to provide both food and cover, raising plantations of mixed fruit, seed and shelter bearing tree species valuable for both timber and wild life and with adequate ground cover vegetation; adequate water supply in ponds and tanks either within or adjoining plantation; soil conservation practices such as re-vegetation of eroded areas, contour forming, crop rotation, controlled grazing and construction of water ponds and tanks to improve the conditions of wild life species.

Scarcity of fodder may also be due to natural causes such as lack of rains and drought, intensive grazing and accidental or intentional fires destroy food and cover and have a bad effect on water production. The ability of hinds to produce fawns varies widely and is correlated with food supply. For this reason, every possible efforts to prevent fires in the forest should be made.

There are the killers for profit, the poachers. These thoughtless exploiters are slaughtering vast numbers of these animals merely because they can get a few rupees for their meat, horn or hide. Thousands of animals each year are being killed merely because the game-laws cannot be enforced and people want luxuries in their life. Sale of meat of wild animals (like swamp deer) in hotels, restaurants, cafes and meat shops should be banned and a directive to this effect should be issued to the municipalities for its strict enforcement.

The village 'shikaries' with packs of dogs, prowl round the forests in the moonlight—they also sit up on water holes, killing everything that moves.

One may condemn killing for sport, but at least the sportsman is concerned that the source of his sport is not destroyed; the village hunters with packs of dogs could not care less.

A special officer should be appointed for the Park with adequate staff and facilities to ensure proper supervision and prevent poaching so that the swamp deer may be conserved. Under the existing rules, punishments for poaching should be more severe. The number of forest and game watchers should be increased. Rewards for apprehending offenders should be given.

Wanton destruction of wild life, in the name of crop protection should be combated. Once Pandit Jawaharlal Nehru said that "cattle are let loose and become wild and become a danger not only to crops, but to human beings also". Crop protection licenses should be restrictedly issued and barrels of guns issued for this purpose should be restricted to 18" or 20" in length.

There should be stricter control on the plying of motor vehicles on forest roads especially between sun-set and and sun-rise.

Other main impediments for successful conservation are the advent of high-powered rifles and Follidol poison; breaking game laws without getting caught; difficulties and laxity in law enforcement. Conservation may mean complete protection, but not necessarily. In most cases it means proper control. The mistake so often made by the ill-informed and the sentimental is that they are unable to see the difference between controlled conservation and indiscriminate destruction.

Another proper agency to increase the shrinking population of the swamp deer is man's publicity and propoganda which can be of utmost importance. Efforts may be made to enlighten the people on the importance of conservation of wild life. For carrying out publicity and propaganda in a proper way, more wild life boards should be set up and a publicity section consisting of an officer experienced in publicity work, an artist, a photographer and a draftsman with necessary equipment, should be attached to the Chief Wild life Warden. This section should do publicity by properly displaying and widely distributing the colourful posters, pamphletes, attractive pictures, pictorial maps and postcards. Wide publicity can also be done through the medium of newspapers, radio etc. Museums should be established at all state capitals.

Secondly during the Wild life on Week, in October, every year, documentary films on the conservation of wild life species such as Swamp deer, should be shown high lighting the consequences of mass massacre and the benefits of its preservation so that the masses may become conscious of it.

Right kind of publicity be done in such a way that the local members of the legislature may themselves spread the gospel of nature conservation among their constituents.

Local human populations adjacent to a rare species of wild life like the Swamp deer should be induced to take pride in their accidental trusteeship, so that they could then proudly boast of being the sole custodians of the only survivors of that species in the world.

The diseases of Swamp deer should be studied and investigated thoroughly and carefully and efforts should be made to know which disease is fatal or dangerous to this animal and the measures required to check it. The Swamp deer in their natural state are quite healthy and suffer no ailments except intestinal parasites. Other diseases are usually spread by domestic stock that are driven into the forest in a large herds for grazing.

Predators such as tigers, panthers, and wild dogs prey on swamp deer among other ungulates and regulate the size of their population to the quantity of food available. They kill by exploiting a psychological weakness. Tigers, panthers and wild dogs play a prominent role as agents of natural selection by killing a large number of genetically weak and aberrant animals. Predators and scavengers are an essential link in the ecological

chain. Wild dogs are treated as 'Vermin', but their selective function as predators is now accepted. The means of controlling these creatures which are considered vermin are much more powerful than ever before.

Detailed studies should be undertaken on the behaviour of the Swamp deer in its natural habitat and the information obtained may be utilized in introducing this animal to new areas.

If necessary, animals should also be brought from outside to make up the deficiency caused due to unrestricted poaching and destruction during recent years.

What I personally feel is, that unlike the Pyramids of Egypt, the Swamp deer if protected from destruction, is not thereby necessarily guaranteed continued existence. Animals must in the fulness of time die, and the only way to guarantee the continuance of a species is to provide for it the right habitat so that the cycle of death, birth and death can continue. Mere protection from destruction is a negative approach.

The tragedy of the swamp deer is the poignant recital of a fate which has overtaken many of nature's once abundant species. *Homo sapiens* has perfected the art of destruction and glories in its refinements, but is powerless to reinstate the meanest of nature's creations. In brief the decline is due, mainly, to man's own action in changing their habitat.

Some Interesting Features of Game Management in Hungary

By

M.A. RASHID, I.F.S.

My inclusion in the official Indian delegation to the World Hunting Exhibition, Expo-71, held during Aug-Sept., 1971, at Budapest, Hungary, gave me an opportunity to learn something about game management in Hungary. A few salient features of the same, which would perhaps be of interest to sportsmen, conservationists and wild life managers in India, are given below.

The forest area of Hungary is about 14000 sq. kms., representing about 40% of its total land area. Thus, from the point of view of the extent of its forest area, it could roughly compare with the State of Gujarat which has a total forest area of about 16650 sq. kms. (representing less than 10% of the total land area). However, the comparison between the two ends here, for the forests of Hungary are so well stocked with game, managed and regularly harvested on strictly scientific lines, that our wild life managers would only gape in wonder and envy. Some current statistics of Hungary's game populations are given below, which speak for themselves:—

Roe deer	...	1,48,900
Red deer	...	36,000
Wild boar	...	16,500
Fallow deer	...	2,600
Mouflon	...	2,400
Rabbit	...	8,45,000
Ring-necked pheasant	...	15,39,000
Partridge	...	6,72,000

Besides, there are over 30 wild life sanctuaries and one national park in this tiny country, equivalent in size to one of our smaller States.

The credit for this happy state of affairs goes to a well knit and effective organisation for the control of hunting and to the presence of enlightened and law-abiding sportsmen who are vitally interested in ensuring the perpetuation of their sport. All hunting is controlled by a National Hunters' Association (there is a similar Association for angling too), with a large number of local or regional Associations affiliated to it. These local Associations issue game licences for the hunting areas falling within their respective jurisdictions, besides dealing with other related issues, such as imposition of bag limits,

destruction of vermin, etc. The police authorities issue arms licences only on the recommendation of these Associations. It is further interesting to note that it is obligatory for every sportsman to enroll as a member of a Hunters' Association before he can secure arms and game licenses, and for doing so, he has to pass a qualifying examination covering such subjects as handling of firearms, wild life ecology, game management, game rules, etc. This is a pretty stiff test, as can be seen from the fact that the total number of qualified sportsmen in the whole country is hardly 10,000 to 12,000. Stiff penalties are imposed for law breakers and poachers. For example, the penalty for illicitly shooting a stag is as high as 40,000 forints (about Rs. 10,000/-), apart from the confiscation of firearms and expulsion from the coveted membership of the Hunters' Association! Little wonder then that poaching in Hungary is almost unknown and the game is so successfully preserved for purposes of bona-fide and systematic sport. Similar conditions are also said to prevail in many of the other East European countries adjoining Hungary.

What a contrast this provides from conditions prevailing in our country, where every Tom, Dick and Harry can obtain arms and shooting licences for the mere asking, only to indiscriminately blaze away at anything that moves in the bush, regardless of species, age, sex or season, not to speak of resorting to the most unsporting methods and techniques of hunting, such as the use of vehicles and blinding flashlights, sitting up over water holes in summer and, what not!

If we were to take our wild life and its conservation as seriously as do the Hungarians—and most of the developed countries for that matter—there is perhaps a remote chance, even at this belated stage, of salvaging what remains of our once teeming wild life, which few countries of the world could match in terms of variety and sport potential. It would perhaps be worth exploring the feasibility of educating our sportsmen in the basic principles of wild life ecology and management and in the ethics of sport so as to ensure that only qualified and responsible sportsmen are permitted to pull the trigger against our game animals and birds. But who, one might well ask, will 'bell the cat'? In a country where even the very custodians of wild life, more often, than not, wallow in ignorance, who is going to train and educate the sportsmen? This, no doubt is the most formidable hurdle to be crossed. Perhaps, our various Natural History and Wild Life Preservation Societies, backed by official patronage and funds, could take up this Herculean task by starting training classes in the various States. The active participation of the various Rifle Associations and Gun Clubs at the national, state and district levels in such a campaign, also deserves consideration. It is for the competent authorities and the conservationists to weigh the pros and cons of this proposal and to work out a practicable and viable scheme for achieving this objective. In the meantime, the provision of drastic penalties which would serve as an effective deterrent against poaching and serious breaches of the game rules, including stiff fines, a compulsory sentence of imprisonment and confiscation of the firearm used for committing the offence, must be immediately brought into effect, regardless of the political

considerations or pressures which have been the bane of our wild life during the post-Independence era. Another step towards a more effective implementation of our game laws would be the creation of special courts in each Forest Division with powers of summary trial — on the lines of those set up by the Railways to deal with cases of ticketless travel—to try offences against wild life. Unfortunately, most offences of this nature fail to stand the test of legal technicalities in the ordinary criminal courts which insist on the production of eye witnesses who are rarely forthcoming in such offences committed in interior forest areas. Securing a conviction under these peculiar and unfavourable circumstances becomes almost impossible. Even in those rare cases where the prosecution is fortunate enough to prove its case, the punishment inflicted by the learned magistrate is so ridiculously light that the whole legal process degenerates into a frustrating exercise in futility. These handicaps could be circumvented by providing for the summary trial of such offences by the special courts proposed above. Unless there is some such tightening up of the legal machinery to deal with wild life offences in a more serious and effective manner than at present, the prospects of saving the remnants of our precious wild life appear bleak and extremely remote.

I would welcome comments from fellow conservationists on my above views and suggestions.

The Pinch Period

By

SAROJ RAJ CHOUDHURY

It pinches particularly hard, the food collection bag—the rumen or the paunch, I mean—in many of the grass and other plant foraging animals. In the snowy temperate regions it is the winter. In much of our country it is the summer.

Scarcity in food.

The main sustenance, food, gets scarce in the wildlife range. The inherent lean supply of food, in summer, is rendered even more rigorous in many areas by setting fire to the food bowls—accidental fires are rare in nature—a sad reflection on the myopic human behaviour. Wildlife, as a result, has to strive harder during the pinch period.

Competition for food.

The odds during this period increase further, due to the heavy influx of domestic livestock. Cattle, goats, sheep etc., have food habits very similar to those of the wild herbivores. Competition for food becomes keener as the summer deepens, more severe in those ranges where the growing scarcity of water forces the concentration of animal populations in the neighbourhood of water-holes.

Restricted mobility and forced crowding around limited water-holes.

Unlike arboreal winged animals, land animals have restricted mobility. They would not normally forage at one place and then walk long distances to take water at locations beyond their maximum cruising distance. They would per force move closer to water. There would thus be heavy crowding around the water-holes. Even though one may not see them, except in comparatively open range, animals do leave enough fresh signs—hoof marks, or their inert fecal matter—in the area, to render them to objective sampling. Actual sampling of such signs in the field shows, a much higher concentration of populations nearer water-holes, with the progress of summer. These support the diagnosis in the range conditions—the limiting effect of watering facilities—which force the populations to adverse crowding.

Scope for the use of available food narrowed—worst for ruminants.

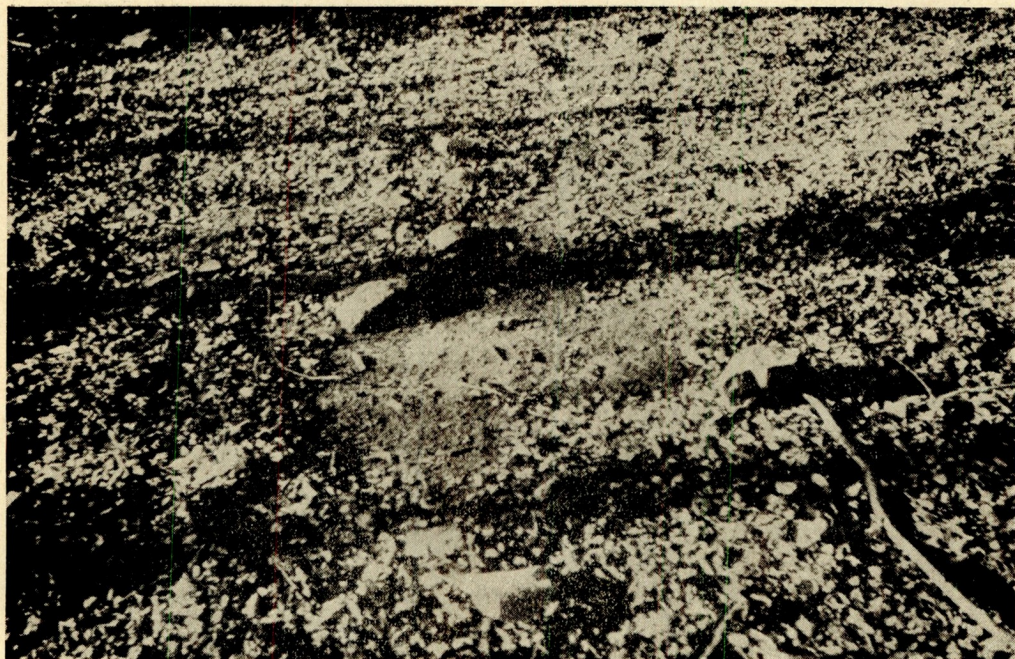
Thus, it happens, that in those wild life regions in our country, affected by the summer pinch period in water, not only does the food get scarcer in the wild life range, but the scope for the fuller use of the available food is even more restricted by water. This introduces heavy competition, and, of all such inter and intra-specific (among different species and within the same species) competitions, those affecting ruminants become the most crucial.



Dry teak (*Tectona grandis*) leaves eaten by cheetal and sambar in Gir Sanctuary



Dry sal (*Shorea robusta*) leaves eaten by cheetal and sambar.



Dry leaves of kardhai ((*Anogeissus pendula*) eaten by deer and cattle at
Sawai Madhopur in Rajasthan.



Water hole made by elephants at Chila in U.P.

Important ingestive behaviour of ruminants.

The ruminants are the deer, antelopes, bovines, sheep, goats and their intermediaries. They have a special large chamber within their stomach which is known as the rumen or the paunch. Here, under normal conditions, the available forage is taken in grazing and browsing, within a comparatively short time. This stored food is later on recycled through the mouth, in the shape of small balls or boluses, masticated and is then returned to the stomach—by what is known as rumination or cud chewing, which many of us must have seen in domestic ruminants such as cows and buffaloes. For doing this at leisure, the wild ruminants go to known places of solitude and safety. This has high survival significance in their relation to the predators.

Normal routine of ingestive behaviour and other daily functions is upset.

When food gets scarcer, the time for its collection gets stretched. With the conditions of stress increasing in summer, these animals may not be able to collect their full daily needs within the permissible routine of an average animal day. Such animals have necessarily to manage to survive through the lean period, with much less food than their actual requirements. Often they have to fill their stomachs with stuffings, i.e., ingested matter with none or very low nutrient value. The effect is evident in the general emaciated condition of the animals.

Side effects of prolonged nutritional deficiency.

The crippling nature of a prolonged period of insufficient or stuffing food affects the populations in many of their vital life functions. If it is during the rut, breeding efficiency falls. In pregnant females, the foetus is adversely affected. And, when it is disease, it rapidly sweeps through the population with its lowered resistance. This is why, it is called the pinch period and it greatly affects the dynamic life functions in the wilderness.

Search for adjustment.

Wild animals have different grades of appetitive (searching) behaviour; for food, for better range, for shelter etc. It is this behaviour which promotes the diffusion of population. Colonisation of new ranges and the filling in of vacant niches stems from the stimulus of this behaviour. And, it is this appetitive behaviour which urges the selection of new food items to withstand adverse competition for survival, especially during the pinch period.

Some examples of adjustment. The Chilla forests, opposite Hardwar.

The first mid-summer (1970) that I spent at the Mundhal Chowki, in Gohri Forest Range, opposite Hardwar, Uttar Pradesh, I was amazed to see the avid licking up of the shed inflorescence of sal, by cheetal, from under the matting of dry sal leaves. Cleaned out patches with rims of piled up dry leaves pushed by the muzzle to get at the shed flowers, were all too evident in the sal patch in Andher block near the Ganges. Some times we

actually saw the cheetal doing it in broad day-light. To objectively confirm the high palatability level of this acquired taste, we lopped a few sal branches with tender seeds and leaves one afternoon. On our way back from the Ganges river at 8 p.m., we found 128 cheetals crowded under those sal trees. On checking the lopped branches a little later, we found all the seeds and leaves gone, browsed clean. Amazing! This is contrary to the opinion expressed by the Expert Committee on the ingestive behaviour of cheetal? The Committee's Report states that spotted deer do not take sal. They do here and with gusto. And again, they have gone a long way ahead here, to add many other items to their food habits to keep them in far better health than in Corbett National Park which lies in a similar tract, the Siwaliks.

The Sawai-Madhupur sanctuary in Rajasthan.

At the end of summer, the same year, I was with my students in the Sawai-Madhupur Sanctuary in Rajasthan. It was a feast for the eyes to view the exuberant health of the sambar and the cheetal there, and the length and spread of antlers, those of the sambar in particular. The nilgai were equally robust. And those little chinks! Just crystallised vitality. The first male chinkara that I saw, was in a leafless stand of *Anogeissus pendula*, opposite Rajbag. Over the glossy cover of his satiated body I could see the ripples of every muscle as he stood restless, sizing me up, before he zoomed off, his dainty hoofs barely touching the ground. The health of the animals indicated the wholesome range conditions. Bhism Chandra, Wildlife Warden from Rajasthan, one of my students of the first batch, told me that the wild ungulates in Rajasthan were sustained during the summer, by the dry shed leaves of *Anogeissus pendula*. Would the forester elsewhere and the wildlifer—indigenous and foreign—believe it without seeing? I obtained some further objective inferences during my next visit there with the second batch of my students, in the summer of 1971. Systematic line-plot sampling in .00001 hectare plots—17.9, (for convenience 18 centimetre) radius circular plots, 50 steps apart, gave us an indication of the available dry leaves of *Anogeissus pendula*, lying on the ground. This worked out to an average of 3.8 tonnes per hectare. We saw the cheetal and the nilgai actually licking up the leaves in sizeable patches. In February, 1972, when I took the third batch of my students there, the shedding of *Anogeissus* leaves had already started. I had noticed also, during my earlier visits, a perceptibly heavier influx of cattle into the sanctuary. Co-ordinated use of any wild life range—even parts of National Parks—by disease-free cattle is a boon to proper land use, for sustained economic growth. Persistent over-use by a heavy influx of all and sundry cattle does just the opposite. It is happening now in the Chilla area in the U.P. Siwaliks. I had discussed this with my students. Fateh Singh, one of them, who is now the Wild Life Warden at Sawai-Madhupur, has many ingenious ways of controlling misuse or overuse of the sanctuary by unrestricted human behaviour. He has controlled the cattle influx and the villagers now collect the dry fallen leaves of *Anogeissus pendula* for their draught cattle. This modified behaviour can be methodised and harnessed to useful

purpose. The villagers may clean and heap the dry leaves, take half or two thirds and leave the rest for the wild life, in a better available form. Offered thus within easy reach, there should be more complete actual integrated use of the available fodder. And, more important, it will mitigate any large-scale fire hazard during the summer.

The Gir forests of Gujarat.

From Sawai-Madhopur we went this time—February, 1972—to the Gir forests. Gir is now very much on the world wild life map because, it is the only home of the rare Asiatic lion, otherwise known to us as the Indian lion, *Panthera leo persica*. Quite substantial works, though largely with discordant priorities, have been and are being done in Gir, both by foreign and Indian students. Saving the endangered lion is the pivotal problem. To acquaint my students with the nature, progress and results of those works and also to see this lion in its natural habitat, was the main purpose of our visits. Stephen Berwick, one of the American research scholars, working on the wild ungulates (primary ruminants) of Gir, had informed me that he had found some teak leaves in the food of cheetal.

On February 9, 1972, I, with my students, was doing a wide traverse from Western to Eastern Gir and back, through the major habitat zones. While passing through the western teak zone I kept noticing a significant recurrence of cleaned patches in the uniform mat of dry teak leaves on the ground. The Sanctuary Superintendent, J.D. Tolia, one of my students in the third batch, suspected that they were patches swept for fire-tracing. Some suggested that the cause was differential resistance to wind pressure. A local man told us that it happened during the herd movement of the 'donger', the cattle of the 'Maldhari', graziers.

There was fortunately, a breakdown in our vehicle. We had to break journey at Kankai for a well-exchanged two hours trek inside the surrounding forests. We examined carefully and discussed the cleaned patches in the spread of dry teak leaves. Any shifting of the dry leaves would cause pile-ups at the edge of the cleanings. There was no evidence of this. The leaves had evidently been picked clean. Keener observation revealed scattered hoof marks of cheetal and sambar in the patches. And then, the most convincing evidence was the hard mid-ribs, strewn in the cleaned patches; leftovers after the feeding.

We could not cover the Gir cross-section on the 9th. We did it the next day. On our way back from Tulsishyam through Southern Gir, we saw cheetal and nilgai in Janvodla block. They were in a teak forest with a thick mat of dry teak leaves on the ground. Belt samples, assessed at random, showed heavy incidence of fresh pellet-groups of cheetal, sambar and nilgai. Evidently these animals were frequently visiting this area and spending a considerable part of their time there, to leave such high densities of their pellet-groups. We found frequent and sizeable clean patches with random hoof marks and many

mid-ribs of dry teak leavess. In the waning light of dusk, near Sasan, I watched through a 8×21 monocular, cheetal on the road side, actually browsing on dry fallen leaves of teak.

The barrier of ingrained subjective bias.

All this was too much for the psychological barrier ingrained, as a forester, in me and my students, "Teak is of no use as food for the animals". It was hard for us to believe this evidence but all doubts were dispelled with the objective analysis and correlation of the replicated signs and symptoms in the field. Perhaps this behaviour does not occur or is not of this high intensity, elsewhere in the country. But have we carefully examined the conditions and signs as we did in this case? The salient fact remains that looking at the range conditions in Gir in early February, it was evident that there was plenty of green matter, including grass, for use by the ungulates. Yet, the dry teak leaves were being ingested in large quantities, apparently not as stuffing. The strong inference would be that perhaps these leaves have an attractive acquired taste for these animals and also a nutritive value as indicated by the health of the animals. Nutrient analysis of these dry teak leaves is being taken up. The adaptation, however, is significant in view of the heavy pressure of cattle in Gir.

The Talchhappar Sanctuary in Rajasthan: survival with human aid.

On February 15, 1972, I was, invited to visit, the Talchhappar black buck sanctuary, which is on the fringe of the desert in Rajasthan, and was in the invigorating company of a very enthusiastic wild life conservationist, G.K. Bora, the Chief Conservator of Forests, Rajasthan. The sanctuary covers 7 sq. kms of an isolated grassy frost-hole with a surround of intense human activities, the contiguous Chhappar town in particular. There are between 350 to 400 black bucks in trim condition in this area. Their food was dry blades of grass of which there was plenty. The animals get their requirement of water, during summer, from the rain water storage cistern in the central region of the sanctuary. Rain water is collected in a covered rectangular concrete tank fed by a wide brimmed masonry saucer. The saucer catches the rain water and channels it down through small holes into the cistern. Because of the cover and the few small holes, the evaporation loss from the stored water is minimal. When the water-holes in the sanctuary dry up in summer and there is water scarcity everywhere, a few buckets from the tank, drawn through the man-hole (padlocked and secured) are doled out every evening by the Forest Guard, to quench the daily thirst of the animals. Thus stay the black bucks in Talchhappar, without any need for shifting during the summer. Indeed there is nowhere else to go ! !

Evidence to look for in the field for objective evaluation.

With an open mind and keen eye, we don't have to look far for evidence to interpret and evaluate the behavioural adaptations of wild animals in withstanding less favourable conditions during the pinch period. Increase in the use of dry forage can be determined in

the field by watching the change in colour of the dung or the pellet-groups, more confidently the pellet-groups. Green forage, with chlorophyll, makes the pellets soft and black. Dry fodder makes them shiny and hard, pale buff to light brown in colour, often speckled or streaked. This change has been noticed in all the study areas that I have mentioned. I have often seen it in Orissa and neighbouring Bihar. Because of its ready response to aging, it may well form a dependable parameter to assess the seasonal gradients in the behaviour and densities of wild ruminants, and assist us in estimating the degree and extent of stress, if any.

Rational subjective projection.

When the animals are taking in large quantities of green matter, the need for water is not as acute as when the bulk of the food consists of dry fodder. It stands to reason, therefore, that with the increase in the ingestion of dry matter, the limiting effect of the water-holes on the range use-factor will be measurably pronounced.

In some areas, elephants delay the shifting of the animal populations by digging holes for fresh water. They do it by a forward scooping of the sand with their front toe nails. We have often seen these artificial water-holes strewn all over the sandy-nala beds in the elephant forests of Lansdowne Division in U.P. The intensity of digging increases as the summer sets in. I have seen it in some places in Orissa. It happens in many other dry areas too. The crystal clear water oozing through the sand, is cool and tempting. The elephants use it. Other animals are also benefited; the tiger too.

When the water level sinks beyond the normal elephantine effort—which perhaps is never that determined—the shifting of the populations to the vicinity of permanent water-holes, finally takes place irrespective of all other adjustments by the populations. Thereafter, the portion of the range thus vacated, remains unused till the onset of the rains. Much of the sustaining fodder which may still be available in plenty, in the portion of the range vacated, is consequently lost to the animals for the remaining part of the summer. The net result is that the range dynamics and productivity are considerably affected.

Evaluation of problems.

The problems of our wild life ranges during the pinch period in summer, are summarised as follows.

1. Growing scarcity in vegetal fodder, often accentuated by forest fires.
2. Forced localisation of animal populations, limited by fewer watering places.
3. Increase in inter-and intra-specific competition.
4. Imported additional pressure of competition from domestic livestock.
5. Imbalanced range use resulting in considerable waste in available food in the range.

6. Retarded life functions due to stress—social, physical and physiological—generated in 1 to 5 above.
7. Decline in productivity.

The ruling problems are those mentioned in 1, 2 and 4 above, the rest are corollaries, influenced by the ruling problems. In dealing with these problems, therefore, the essence lies in finding solutions, pragmatic and economic, for the problems mentioned in 1, 2 and 4.

((To be continued))

TIGER NEWS

It has been reported that the World Wildlife Fund would raise 1 million for Project Tiger—an attempt to save the Indian tiger from extinction. Guestimates have placed the population of tigers in India at 2000 whereas 40 years ago it was said to be 40,000. Government of India with the co-operation of the State Forest Departments, have undertaken the census of the tiger throughout the country. The initial figures may not be very accurate but with a species like the tiger which covers vast distances over-night, in search of food, it is almost impossible to get more accurate data in the first attempt at an All-India Census. It is intended to repeat the census in winter and again next summer to give population trends which would be, it is hoped, as accurate as such data can be.

Recently, Mr. Guy Mountford an international trustee of the World Wildlife Fund visited India in connection with Project Tiger. He mentioned that a crusade to ban the import and export of tiger skins was gaining momentum. A number of countries have passed or have formulated legislation to this effect.

The Suspect Killer

BY

S.P. SHAHI, I.F.S.

Chief Conservator of Forests, Bihar

Abbas Mian, aged twelve years, along with his elderly uncle was returning home along a forest track through the Betla National Park. On seeing a lone elephant standing on the path, he threw himself prostrate on the ground and was crushed. His uncle ran to the nearby Forest Office—2 miles away—and the forest staff who reached the spot within an hour of the incident, found the entrails of the unfortunate victim lying by his dead body. This was in November, 1970.

On 21st March, 1971 at 5.15 p.m. a lone elephant chased a truck for nearly a mile on the metalled road passing through the National Park and when he saw two cars parked in the compound of the Tourist Lodge, he turned his attention from the truck, lifted the two cars with his trunk and pushed them into the nearby ditch.

Nine days later Jichhori Devi, wife of the Headman of Gari village was trampled to death while she was sleeping on a *Kurha* (local name for an improvised wooden platform) in her gram field, guarding the crop.

I decided to go to Betla on the 3rd April, to destroy the beast to assuage local public feeling which had been considerably roused by the latest killing of the Mukhiya's (Headman) wife.

The report received was that the killer was a lone elephant roaming in the forest. As chance would have it, the D.F.O., the Game Warden and myself encountered a lone elephant at 11 o'clock in the day. The day, in April, is very hot in Palamau and the elephant to avoid the midday heat had taken shelter in a bamboo forest. The Indian elephant, unlike its African relative, avoids the direct rays of the sun.

Elephants make a peculiar sound to intimidate an intruder by rapping the end of the trunk smartly on the ground, (as seen in the photograph) and emitting air through the tip of the trunk. This is what the lone elephant did on seeing us.

It was the Game Warden who first noticed the "must" flowing from the temple, on each side of the head.

With the recent killings of two persons and overturning of cars parked in an habited locality, fresh in my mind, I was momentarily petrified. A charging elephant spreads his ears, raises his trunk and straightens the tail. This elephant which was a *Makna* (a tuskless male), did nothing of this sort. He however, swiftly came on to the road and followed the jeep. We had earlier taken the precaution of turning the jeep so that it faced away from

him. He would move fifteen to twenty feet towards the jeep and then stand still. We would also move our jeep simultaneously, an equal distance away and his still posture gave us a good opportunity to photograph him. He followed the jeep in this manner for half a furlong and then turned again into the forest and disappeared.

As is invariably the case, this Makna was well built and of good size. According to E.P. Gee, "nature has compensated Maknas with greater size and strength of neck and trunk to make up for the lack of tusks. In a fight a Makna can break off one of its adversary's tusks with its trunk". This Makna fitted this description well.

Male elephants (sometimes females too) are subjected to periodical paroxysms, supposed to be of a sexual nature, and an oily matter exudes from a small hole in the temple on each side of the head between the eyes and ear holes. The temple also swells. The elephants under the influence of 'must' are described as "mad" and their behaviour in such a state is unpredictable. According to Sanderson who has observed wild elephants for 13 years, fits of 'must' differ in duration in different animals. In some they last for a few weeks, in others for even four or five months. Some naturalists believe that "must" indicates the elephants urge to fight and even kill before mating. Our Makna did not appear that vicious.

It is remarkable how an elephant can go unnoticed in the forests in spite of its huge size. It might be standing close to you and yet it stands so still that it is difficult to know it is there. If an elephant feels that it has not been seen by man, it moves away without the slightest sound even in dense forests. When disturbed by man, it usually crashes through the forest undergrowth knocking down trees and occasionally trumpeting shrilly. This Mikna did not charge as we feared he would nor did he crash into the forests breaking trees and branches in the process—probably the peak of his "must" was over. It is likely he had overturned the two cars and killed the two persons when he was at the height of his "must". These two incidents had occurred within ten days of each other.

Besides the lone bull, there were in the National Park at this time two elephant herds—one of five, consisting of 3 full grown cows with their 2 less than a year old calves; the other of four, 2 males and 2 young cows. We watched these two herds closely. None of them were in "must". Only one bull had been wandering about in the forest alone and this was our Makna, in 'must'. Probably a 'must' elephant leaves the herd and prefers to lead a solitary existence during this period.

Although there was strong suspicion that this Makna in 'must' was the killer of the lady and the young boy, and was also responsible for overturning the two cars, the consensus of opinion among us was to give him the benefit of doubt. No one had cared to see that the elephant that had chased the truck and had tried to settle issues with the two cars was in 'must'.

Even elephants not in 'must' behave erratically at times. Lydekker mentions of an instance of a wild elephant trying conclusions with a railway train. The dual occurred in broad

day-light in the Malaya Peninsula and the elephant was "the deliberate aggressor". The engine-driver, seeing a big tusker on the railway track had brought the train to a standstill, whereupon the tusker encouraged by his enemy's unwillingness to attack, took the offensive and charged bravely, so bravely that he broke his tusks to pieces and injured his head. For over an hour, the elephant held the position, charging repeatedly. After he had battered his head, he turned his hind-quarters to the engine and tried to overturn it.

Lydekker mentions of another instance in Bihar, on the night of September 28, 1882, when a train of the Bengal-Nagpur Railway (now South-Eastern Railway), while travelling at a speed of 30 miles an hour collided with an elephant between Goilkera and Manoharpur. Not much is known as to why this happened. Very recently on 19.12.71 at about 22.00 hours, the engine-driver of the Rourkella-Howrah Down Express, saw an elephant standing by the side of the railway track from a distance of some 50 yards. He pulled the whistle and tried to stop the engine but as the train was in speed he could not do so. The elephant which normally senses danger very effectively, came right on to the track, was dragged about 100 yards and was killed. This happened in the same forest area as the one described by Lydekker, some ninety years earlier. While the Lydekker's elephant's tusks measured 72", the one recently killed measured a mere 32". It could be a young bull or very likely there has been a degeneration in the race, like in Africa. The Elephant's behaviour at times is extremely unpredictable.

An enquiry into the car incident revealed that the truck had suddenly met the lone bull near a bend on the metalled road and had dashed into him. This may have enraged the bull, who chased the truck for nearly a mile and seeing the 2 cars parked in the Tourist lodge compound had thrown them into the ditch. Such behaviour, though unusual, is possible with wild elephants.

Apart from the killing incidences described above, a herd of elephant had trampled to death another five persons in a neighbouring forest division, in the same season last year. Investigation showed that the villagers had fired country-made guns and thrown crackers at them. This had irritated the herd which took its toll. By intensive propaganda the villagers were educated into seeing the folly of their own actions and no casualty has occurred this season. Left to itself, an elephant is a genuine non-aggressor and except showing its annoyance by knocking down trees, drawing in or emitting air from his trunk, means no harm.

While our Makna in 'must' was the only solitary bull roaming in the forest and circumstantial evidence was that he was the killer, we could not condemn him for murder without positive proof, and such proof was lacking. Many wild animals particularly tigers have been shot on the mere suspicion of being killers of men and destroyer of crops, without even a *prima facie* enquiry.

'Wish You a Happy New Year'

BY

S.K. SINGH

Asst. Conservator of Forests, Bihar

When the number of tigers in this country is rapidly declining, it is a rare sight to see one in the forest. It has become extinct in other parts of the World. Now probably it is found only in India and in certain parts of U.S.S.R.* In India it is said that there are only about 3,000 tigers, and in Bihar, only 70, according to the latest estimates. Under these circumstances, one is very lucky when royalty condescends to give us his "darshan". The excitement and pleasure derived from it can only be imagined and is difficult to describe.

On the 13th Jan. '72, when I was going to Kunda on leave, I started by bus from Itkhor, for Chatra at about 1.30 p.m. From Chatra I went to Partappur and reached there at 7.30 p.m. The jeep which was to carry me to Kunda was not there, so I went to the Forest Rest House. There I came to know that the jeep had started giving trouble, so it had gone to a near-by mechanic. It returned at about 8 p.m., and after taking a cup of tea we started for Kunda. A friend of mine, who had brought the jeep, was accompanying me. Later on only did I realize that it was this mechanical trouble which proved a boon in disguise.

We were going on the forest road to Kunda, which is 13 kms. from Partappur. The entire stretch of the road passed through thick forests. As it was dark nothing could be seen except the road flanked with trees and bushes, that too only in the head-lights of the jeep. After covering a distance of nearly 4 kms., we were crossing a short ghat-section of the road. Having crossed it we were going through a bamboo forest. Suddenly, on the right side of the road I saw two eyes, glittering like small fire-balls, in the head-lights of the jeep. Only the eyes were visible and the body was completely concealed behind a rock. My curiosity was aroused. I immediately signalled the driver to stop the vehicle and drew his and my companion's attention towards the shining object. I saw the eyes rising and the whole body became visible and lo the Royalty was there in full splendour and stature. He started crossing the road in magnificent strides without caring for us; as if we were insignificant compared to his personality. It is here and for the first time that I realised why the tiger is recognised as 'The King of the Forest'. This was a big male tiger wearing a beautiful striped coat.

*They are still found in other countries in South-east Asia though India is said to have the largest surviving population—Ed.

How mean it is on the part of human beings to kill him and clumsily and absurdly put on his coat without imbibing any of the magnificent qualities of the animal. It is a travesty of truth that we call him a brute though we have not yet liberated ourselves from the primitive brutish character that we have biologically inherited from our less evolved animal ancestors. We have not yet overcome our reckless killing instinct. When we find that we are unable to kill ourselves we revert to killing innocent denizens of the forest, and the worst part is that we congratulate ourselves over our wanton acts.

Reverting to the tiger, he stopped for some time at the centre of the road with his tail swishing and glanced at us. Then with a jump he vanished into the woods. I really felt very sorry for not having my camera with me. I could read his eyes as saying, "THOUGH YOU HAVE DISTURBED ME IN MY REST, STILL I WISH YOU A VERY HAPPY NEW YEAR".

Revised Synopsis of Birds of Dehra Dun & Adjacent Hills Pt.-II

(*Columbiformes* to *Piciformes*)

BY

R.K. BHATNAGAR AND PRADEEP MISHRA

Birds of seven Orders (*Podicipediformes*, *Pelecaniiformes*, *Ciconiiformes*, *Anseriformes*, *Falconiformes*, *Galliformes*, *Charadriiformes*), have been dealt with in Pt. I of this paper (Cheetal Vol. 14, No. 2—September 1971). The present publication deals with the birds of nine Orders. The methods of reference citation remain the same as in Pt. I of this paper and the numbers of the listed species are in the same serial order.

Order *Columbiformes*Family *Columbidae*

133. *Treron apicauda apicauda* (Blyth): Pintailed Green Pigeon
FBI, 5, 199/1840; SYN, 154/493 and HB, 3, 94/493

Summer visitant around hills of Chakrata and Mussoorie—5,000' to 7,000'. Call of over 20 notes and quite musical (O). Arboreal but for drinking.

134. *Columba leuconata leuconata* (Vigors): West Himalayan Snow Pigeon
FBI, 5, 224/1858; SYN, 159/513 and HB, 3, 120/513

Common on and near snow line, breeding in summers at about 12,000' to 14,000'. Descends during winters to 4,000' often in open valleys where occasionally seen in flocks (O).

135. *Columba rupestris turkestanica* (Buturlin): Turkestan Hill Pigeon
FBI, 5, 222/1857; SYN, 160/515 and HB, 3, 123/515

At high elevations near the snows during summers, in winters within flocks of *C. livia* but is considerably rare in our area.

136. *Columba livia intermedia* (Strickland): Indian Blue Rock Pigeon
FBI, 5, 221/1854; SYN, 160/517 and HB, 3, 125/517

Resident in Dun as well as in high hills. Occasionally individuals of *C. rupestris* occur within its flocks (O); In New Forest Area—in fields at sowing and sprouting of paddy in July and Aug. (W, 49)

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137. *Columba palumbus casiotis* (Bonaparte) : Eastern Wood Pigeon, FBI, 5, 227/1861: SYN, 161/519 and HB, 3, 129/519

Rather uncommon in hill forests and at Chakrata at about 8,000', occasionally found in huge flocks in the sun (one record 1890) (O). Recently Osman (1971) observed a Doon visitant roost on tall Mango trees, feeding on clover and acorn—breeding March and April, nesting 12,000', breeding calls—rhythmic cooing unlike 'coo-oo'; gradual decline in number of visitant birds and now only straggling flocks are seen. Unfortunately no exact locality and months of observations are given.

138. *Columba hodgsonii* (Vigors) : Speckled Wood Pigeon
FBI, 5, 234/1867: SYN, 161/520 and HB, 3, 131/520

Forests beyond Chakrata during May and June at elevations 6,000' to 8,000' (O).

139. *Streptopelia orientalis meena* (Sykes) : Western Rufous Turtle Dove
FBI, 5, 240/1872; SYN, 164/531 and HB, 3, 143/531

Common in summers on hills near Mussoorie and Chakrata and beyond, from about 6,000' to 10,000'. Occurs in Dun (O) and Tons Valley in August and Sept. (W, 49); in New Forest area—on fields during harvest (April), at sowing and at sprouting time (July and August) (W, 49), resident in the area (G, 57).

140. *Streptopelia decaocto decaocto* (Frisvaldsky) : Indian Ring Dove or Collared Turtle Dove
FBI, 5, 248/1879; SYN, 165/534 and HB, 3, 147/534

Commonest Dove in the Dun, also found in lower hills in open and dry deciduous vegetation near villages (O). White (1949) has observed them year around.

141. *Streptopelia tranquebarica tranquebarica* (Hermann) : Red Turtle Dove
FBI, 5, 250/1881; SYN, 165/535 and HB, 3, 149/535

Fairly common in Dun (O); in New Forest Area—(W, 49 & 51) summer visitant (G, 57).

142. *Streptopelia chinensis suratensis* (Gmelin) : Indian Spotted Dove
FBI, 5, 242/1873; SYN, 166/537 and HB, 3, 152/537

'common and confidential in the Dun and lower hills' (O) in moist deciduous, forests, green, open cultivations and scrub. Resident in Masandhanwala area (W, 51) and New Forest (G, 57)

Observed all the year around—max. count in January (W, 49).

143. *Streptopelia senegalensis cambayensis* (Gmelin) : Indian Little Brown or Senegal Dove
FBI, 5, 246/1877; SYN, 167/541 and HB, 3, 155/541

Common Dove in open cultivations and scrub vegetation, usually near human habitations (O; W, 51 & G, 57)—fairly common on ripening crops (March & April) and maturing crops (Sept. & Dec.) (W, 49).

144. *Chalcophaps indica indica* (Linnaeus): Indian Emerald, Green-winged or Bronze-winged Dove

FBI, 5, 215/1952; SYN, 167/542 and HB, 3, 157/542

Resident in Dun [but rare (W, 49)] especially in dense evergreen moist deciduous forest (O, W, 51 & G, 57). Seen singly usually and occasionally in meadows in flocks—near Kuwanwala.

145. *Treron phoenicoptera phoenicoptera* (Latham): Bengal Green Pigeon

FBI, 5, 37/1826; SYN, 156/503 and HB, 3, 106/503

‘.. common in the Dun, feeding often in flocks on figs (*Ficus* spp.), of ber (*Zizyphus* spp.), pipal (*F. religiosa* etc. (O & W, 51) in New Forest area—is resident (O, 57) It is purely fructivorous.

Order *Psittaciformes*

Family *Psittacidae*

146. *Psittacula eupatria nepalensis* (Hodgson): Large Indian or Alexandrine Parakeet

FBI, 4, 199/1497; SYN, 168/545 and HB, 3, 164/545

‘Occurs in the Dun in mixed high forests but is uncommon (O). Tons river-side, Dehra Dun (W, 57); parties commonly seen in New Forest area during rains (G, 57 & 57)

447. *Psittacula krameri borealis* (Neuman): Northern Rosewinged Parakeet

FBI, 4, 204/1501; SYN, 169/549 and HB, 3, 169/549

‘Very common in the Dun especially around Dehra’ (O) end Tons river-side (W, 57), around the year average court high in April and July (W, 49); in New Forest area—resident, common on flowering tree-tops (G, 57).

148. *Psittacula alexandri fasciata* (P.L.S. Muller): Redbreasted Parakeet

FBI, 4, 210/1508; SYN, 169/551 and HB, 3, 172/551

One record in Dehra Dun (Dharam Kumar Singh ji, 1956).

149. *Psittacula cyanocephala bengalensis* (Forsters). Blossom-headed Parakeet

FBI, 4, 206/1503; SYN, 171/557 and HB, 3, 178/557

‘Common in the Dun as well in the lower hills upto about 4,000’ (O). Along Tons River (W, 51); in New Forest area—average count maximum during June and August (W, 49) and resident in the area (G, 57).

150. *Psittacula himalayana himalayana* (Lesson) : Himalayan Slatyheaded Parakeet
FBI, 4, 206/1504; SYN, 172/562 and HB, 3, 183/562

Common in Mussoorie and Chakrata from about 4,000' to 8,000' (O); Tons river-side (W, 51); New Forest area—(G, 51) where it is a winter visitant (G, 57 and W, 49); Rajpur and Sahasdhara Hills. Occasionally one or two individuals of Blossom-headed Parakeets are also seen in flocks of this species.

Order *Cuculiformes*

Family *Cuculidae*

151. *Clamator coromandus* (Linn.) : Redwinged Crested Cuckoo
FBI, 4, 170/1474 ; SYN, 174/569 and HB, 3, 192/569

Summer visitant in lower Himalayan valleys, both east and west of Mussoorie (O).
Food, mainly insectivorous.

152. *Clamator jacobinus* (Boddaert) : Pied-Crested Cuckoo
FBI, 4, 167/1472; SYN, 174/570 and HB, 3, 194/570

Summer visitant in Dun (O); in New Forest area—common rain visitant (G, 57), earliest appearance in July and latest in October (W, 49). Appearance more or less synchronises with the rains and departure with the closing of rains. It is a brood parasite on *Turdoides caudatus*, *T. striatus*, *T. malcolmi*, *Garrulax* spp. and *Lanius schach erythronotus* (Rufousbacked Shrike—a fairly common bird of Dehra Dun). Food mainly comprises caterpillars, bugs, ants, land molluscs and elate termites (HB),

153. *Cuculus sparverioides sparverioides* Vigors : Large Hawk Cuckoo
FBI, 4, 146/1457; SYN, 175/572 and HB, 3, 198/572

Common in the kharshu oak (*Quercus semicarpifolia*) forests, from about 8000' to 9,500' beyond Chakrata. A summer visitor only (O). It is a brood parasite on Laughing thrushes and smaller birds. Food—insectivorous.

154. *Cuculus varius varius* Vahl : Common Hawk Cuckoo or Brain Fever Bird
FBI, 4, 148/1458; SYN, 176/573 and HB, 3, 200/573

Common summer visitant in Dun (O) and New Forest Area (G, 57). Mostly arboreal bird and is a brood parasite on Laughing thrushes and Jungle babblers. Food—mainly insectivorous.

155. *Cuculus micropterus micropterus* Gould : Indian Cuckoo
FBI, 4, 144/1456; SYN, 175/576 and HB, 3, 204/576

Common summer visitant in Dun and in the lower Himalayan slopes and valleys upto 7,000' (O); in New Forest area—summer visitant where calls are heard till August. The

Golden Oriole has been observed as its foster parent (G, 57 & 61); earliest appearance in the area—in April and latest in May (W, 49).

156. *Cuculus canorus canorus* Linn. : The Cuckoo
FBI, 4, 135/1451; SYN, 177/578 and HB, 3, 208/578

Common summer visitant to the hills around Mussoorie between 5,000' and 11,000'. They arrive in the first or second week of April when they may be heard in Dehra Dun as well as in the hills where a few remain to breed while the majority pass on to the hills (O). In New Forest Area—fairly common summer visitant (G, 57), earliest appearance in April and latest in July (W, 49). It is a brood parasite on Pipits, shrikes, babblers, flycatchers, warblers and chats. Female of the species is believed to be polyandrous (HB).

157. *Cuculus saturatus saturatus* Blyth : Himalayan Cuckoo
FBI, 4, 140/1454; SYN, 177/580 and HB, 3, 211/580

Common in the inner ranges of Chakrata from 8,000' to 12,000'. Especially common in the Tons valley from Datmir through Oshla to the Harke Dun...a summer visitant (O). It is a brood parasite on warblers. Call may be syllabilised as:
'That's your smoky pepper' (O).

158. *Cacomantis sonneratii sonneratii* (Latham) : Indian Banded Bay Cuckoo
FBI, 4, 157/1464; SYN, 178/582 and HB, 3, 215/582

Occuring between lower hill forests below Mussoorie and further east (O) where it is uncommon summer visitant. Status-unclear (HB). Brood parasitic on toras, and bulbuls; breeding variable and may be prolonged.

159. *Cacomantis merulinus* (Scopoli) : Indian Plaintive Cuckoo
FBI, 4, 154/1462; SYN, 179/584 and HB, 3, 218/584

Common summer visitant in the Dun as well as in the lower Himalayan valleys upto 5,000' (O). In New Forest area—rain visitant (G, 57), its earliest appearance in May (G, 62). This species is a brood parasite and insectivore.

160. *Surniculus lugubris dicruroides* (Hodgson) : Drongo Cuckoo
FBI, 4, 165/1470; SYN, 180/588 and HB, 3, 224/588

Common summer visitant in Dun, Siwaliks forests and in open country (O); in New Forest area—common during April-June and between August to September (W, 49), species appears rare for during average bird count, only solitary individual were observed (W, 49). Species is brood parasite on minivets, forketails and on drongos. Data on its breeding is needed.

161. *Eudynamis scolopaceus* (Linn) : Indian Koel

FBI, 4, 172/1475; SYN, 181/590 and HB, 3, 227/590

...summer visitor...found throughout the Dun and commonest where the house crow is most numerous as in Dehra (O). In New Forest area—earliest appearance in March and latest in June (G, 51). It is a common summer visitant and is last of the migratory Cuckoos to depart (W, 49). Species is a brood parasite on crows.

162. *Taccoua leschenaulti* (Lesson) : Sirkeer Cuckoo

FBI, 4, 187/1488; SYN, 182/596 and HB, 3, 234/596

Occurs throughout Dun and lower Himalayas but is not common (O). In New Forest area—very rare. Ave. count of only one has been observed in January (W, 49).

163. *Centropus sinensis sinensis* (Stephens) : Common Crow-Pheasant or Coucal

FBI, 4, 189/1490; SYN, 184/600 and HB, 3, 240/600

Common in the Dun especially near and in grasslands near forests (O); in New Forest area (G, 51)—resident but very rare (G, 57). Species appears scarce but in count there is a regularity from February to September (W, 49); in Dun forests it is resident; feeds on variety of things from bird eggs, nestlings, lizards, snakes, mice to insects, but it is not a brood parasite.

164. *Centropus toulou bengalensis* (Gmelin) : Lesser Coucal

FBI, 4, 194/1495; SYN, 185/605 and HB, 3, 246/605

Occurs in the Dun below Asarori, where they breed in July. They probably occur throughout the eastern Dun in rains (O).

Order *Strigiformes*

Family *Strigidae*

Subfamily *Tytoninae*

165. *Tyto alba stertens* Hartert : Indian Barn Owl

FBI, 4, 385/1636; SYN, 185/606 and HB, 3, 250/606

Found in the Dun but is nocturnal and rarely seen (O). Salim Ali and Ripley (in HB, 1969) have observed "highly beneficial to agricultural economy" because it predaes on sparrows, bats, rats and mice.

It is proposed that the species be thoroughly protected and data on its breeding habits etc. be observed.

166. *Tyto capensis longimembris* (Jerdon) : Grass Owl

FBI, 4, 387/1636; SYN, 186/608 and HB, 3, 252/688

Occurs in the Dun on grassy plains (O).

167. *Otus spilocephalus huttoni* (Hume) : Western Spotted Scops Owl

FBI, 4, 427/1672; SYN, 187/611 and HB, 3, 256/611

Confined to hill forests from 5,000' to 8,000'; common in Mussoorie (Type locality—Jharipani) and in the oak, blue pine (*P. wallichiana*) and deodar (*C. deodara*) forests beyond Chakrata (O).

Species was first described by Hume in the year 1870 on type material collected from Jharipani, Mussoorie. It would be worthwhile to study present status, feeding and breeding habits etc. and also to deposit 1 or 2 specimens from the type locality in the National Zoological collection of the Zoological Survey of India.

168. *Otus scops sunia* (Hodgson) : North Indian Scops Owl

FBI, 4, 435/1680; SYN, 188/616 and HB, 3, 262/616

...Excessively common in the sal (*Shorea robusta*) forests of Dun (O); calls heard during summer nights in New Forest (G, 62). Food-mixed,—insects and mice; breeding Feb. to May.

169. *Otus bakkamoena* Pennant : Collared Scops Owl

FBI, 4, 424/1667; SYN, 188/619 and HB, 3, 266/619

Uncommon in Dehra Dun but it may not infrequently be heard after dark (O); in New Forest area—resident (G, 57) Call-single mellow interrogative note 'weet' (H.B.).

170. *Bubo bubo bengalensis* (Franklin) : Eagle Owl or Indian Great Horned Owl

FBI, 4, 414/1660; SYN, 190/627 and HB, 3, 273/627

Nocturnal, occurs in Syed Mohalla and Naya Gaon near Jhajra Forest Block in Dehra Dun. Species must be occurring throughout the area. Salim Ali and Ripley (in HB, 1969) have observed "bird is of major significance to agricultural economy" because it predominantly feeds on field rats and mice besides other harmful agricultural pests.

It is suggested that the species be thoroughly protected and data on its breeding, feeding pattern, etc. be collected.

171. *Glaucidium brodiei brodiei* (Burton) : Collared Pigmy Owlet

FBI, 4, 450/1696; SYN, 193/635 and HB, 3, 285/635

Common in the hill forests from about 6,000' to 10,000' (O); in New Forest area—one record Dec. 56 (G, 57). It is insectivorous, feeds on cicads, grass-hoppers, beetles, lizards, birds and mice. It breeds between March-June (HB).

172. *Glaucidium radiatum radiatum* (Tickell) : Barred Jungle Owlet

FBI, 4, 448/1694; SYN, 193/636 and HB, 3, 286/636

Common in the Dun. It's a forest bird but is not very nocturnal (—crepuscular) (O);

in New Forest area-resident, fairly common (G, 57), maximum average count has been observed in March-April when crops with ears are standing high (W, 49). Dominance during ripe crops which obviously indicates that the species comes to predate on field mice etc. which are harmful to crops. Thus this species too appears of significance to agricultural economy and it is suggested that it be protected and field data on its breeding etc., collected.

173. *Glaucidium cuculoides cuculoides* (Vigors) ; West Himalayan Barred Owlet

FBI, 4, 444/1689; SYN, 194/639 and HB, 3, 289/639

Found in the hills both around Mussoorie and Chakrata, but is not common (O). Possibly seasonal altitudinal migrant, common and largely diurnal (HB).

174. *Ninox sculata lugubris* (Tickell) : Indian Brown Hawk Owl

FBI, 4, 454/698; SYN, 195/642 and HB, 3, 292/642

Fairly common in the forests of Dun, also occasionally heard in Dehra (O); in New Forest area—rare resident (G, 57).

Practically nothing is known on the breeding habits of the species hence it would be of worthwhile use to collect data on its breeding habits etc.

175. *Athene brama indica* (Franklin) : Northern Spotted Owlet

FBI, 4, 440/1684; SYN, 196/650 and HB, 3, 299/650

...common little owl in the Dun, frequenting compounds, camping grounds, old deserted houses and mango topes (O); in New Forest area—common resident, but from average year around count, species appears rare (W, 49). Feeding, largely carnivorous—insects and mice etc.

Order *Caprimulgiformes*

Family *Caprimulgidae*

176. *Caprimulgus europaeus unwini* Hume : Hume's European Night Jar

FBI, 4, 359/1619; SYN, 202/673 and HB, 4, 12/673

Common in the hills around and beyond Chakrata from about 6,000'-8,000'. They frequent slopes with southern aspect, especially in ban oak (*Q. incana*), deodar and blue pine forests (O), food-insectivorous. Breeding, May-July.

177. *Caprimulgus macrurus albonotatus* Tickell : Indian Longtailed Night Jar

FBI, 4, 361/1620; SYN, 203/675 and HB, 4, 16/675

Exceedingly common (crepuscular and nocturnal) in the Dun especially in sal forests and well-wooded ravines (O); in New Forest, resident (G, 57). Feeds on a variety of insects and breeds between March-May.

178. *Caprimulgus asiaticus asiaticus* Latham : Indian Little Night Jar
FBI, 4, 366/1625; SYN, 204/680 and HB, 4, 21/680

...fairly common (crepuscular and nocturnal) in the Dun, but not in the dense forest, prefers open low jungles, groves and gardens (O). Feeding—insectivorous and breeds Feb.-Sept.

179. *Caprimulgus affinis monticollis* Franklin's or Allied Night Jar
FBI, 4, 370/1629; SYN, 205/682 and HB, 4, 23/682

Common (crepuscular and nocturnal) in the Dun, frequents the dry stony beds of streams interspersed with patches of dry grass, near but not in the forests. Common near Karwapani (O). Breeding variable, but usually March-August.

Order *Apodiformes*

Family *Apodidae*

Subfamily *Apodinae*

180. *Chaetura caudacuta nudipes* (Hodgson) : White-throated Spinetail Swift
FBI, 4, 340/603; SYN, 207/688 and HB, 4, 33/688

...occasionally to be seen at about 9,000' in the hills beyond Chakrata (O). Feeding—insectivorous; breeding not known correctly. Bird is one of the faster fliers amongst birds (HB).

181. *Apus melba nubifuga* (Koelz) : Indian Alpine Swift
FBI, 4, 324/1589; SYN, 208/693 and HB, 40/694

Occasionally seen in the hills beyond Chakrata (passing over). Abdomen white but no white rump (O); New Forest area—rain visitant (G, 57). In distributional range, Salim Ali and Ripley (in HB) have observed 'resident, but subject to seasonal local migration (chiefly during monsoons) in addition to very extensive and wide ranging daily foraging peregrination'. It is insectivorous.

182. *Apus affinis affinis* (J. E. Gray) : The Common Indian House Swift
FBI, 4, 332/1596; SYN, 211/703 and HB, 51/703

Very common in the Dun, especially in Dehra and Mussoorie (O); In New Forest area—resident, partly migratory, (G, 57), earliest seen in April and latest appearance in September; maximum average count in month of May (W, 49).

Sub family *Hemiprocinae*

183. *Hemiprocne longipennis coronata* (Tickell) : Crested Swift
FBI, 4, 354/1616; SYN, 212/709 and HB, 58/709

.. common bird in the Dun, where they breed in March-April. They are fond of forest edges, big trees near water—Karwapani, Lacchiwala and Kansrao (O).

Order *Coraciiformes*

Family *Alcedinidae*

184. *Ceryle lugubris guttulata* (Stenjneger) : Pied Kingfisher

FBI, 4, 248/1532; SYN, 214/718 and HB, 70/718

'Found on all the larger streams in the Dun (Sahasdhara, Manjhara, Raipur, Kansrao—rarely, Lacchiwala, Asan—during rains etc., as well as in the Ganges and Yamuna (Dakpathar). It is also found up the Tons river and its tributaries as high as 5,000' (O); New Forest area—earliest appearance in February, latest in September (W, 49).

185. *Ceryle rudis leucomalanura* (Reichenbach) : Lesser Pied Kingfisher

FBI, 4, 246/1531; SYN, 215/719 and HB, 71/719

A very common bird on all rivers and streams in Dun (O); in New Forest area—appearance during rains (G, 57).

186. *Alcedo atthis* (Linn.) : Common Kingfisher

Not common in Dun. Also found on Himalayan streams upto 5,000' e.g. Ram Sarai Valley (O); in New Forest area—rare resident (G, 57), earliest appearance January and latest in April, regular appearance sometimes October-January (W, 49).

187. *Pelargopsis capensis capensis* (Linn.) : Storkbilled Kingfisher

FBI, 4, 265/1548; SYN, 218/730; and HB, 4, 84/730

Occurs but not common in the Dun. A pair may usually be seen near Karwapani, others near Lacchiwala and Kansrao (O).

188. *Halcyon smyrensis smyrensis* (Linn.) : Whitebreasted Kingfisher

FBI, 4, 269/1551; SYN, 219/735; HB, 4, 89/735

A very common bird in the Dun. Found almost everywhere except in forest (O); in New Forest area—fairly common resident (W, 49 and G, 57).

Order *Coraciiformes*

Family *Meropidae*

189. *Merops supeciliosus persicus* (Pallas) : Bluecheeked Bee-eater

FBI, 4, 237/1526; SYN, 222/747 and HB, 4, 104/747

'...common species...found infrequently in the Dun' (O); in New Forest area—summer visitant (G, 57); earliest appearance in April, latest in September and max. dominance during April-May (harvesting time). (W, 49).

190. *Merops orientalis orientalis* (Latham) : Common Green Bee-eater
FBI, 4, 234/1523; SYN, 223/750 and HB, 4, 109/750

'.. common throughout the Dun, where it is a summer visitor' (O), in New Forest area—resident and partly migratory (G, 57), earliest appearance in April, latest in October and dominance between April to October (W, 49).

191. *Nyctiornis athertoni athertoni* (Jardine & Selby) : Blue-beared Bee-eater
FBI, 4, 242/1529; SYN, 223/753 and HB, 4, 112/753

'.. not rare in the Dun, where it is found among other places in the nalas at Gurkha Cantonment at Dehra Dun and is a resident species (O); in New Forest area—resident (G, 57), earliest appearance in April (at harvesting time) and latest in October when second crop is harvested—appearance appears rare (W, 49).

Family Coraciidae

192. *Coracias benghalensis benghalensis* (Linn.): Indian Roller or Blue Jay
FBI, 4, 224/1517; SYN, 224/755 and HB, 4, 116/755

Common throughout Dehra Dun (O), (G, 57). In New Forest area—year around but dominance in June at the time of rice sowing (W, 49).

Family Upupidae

193. *Upupa epops epops*, (Linn.) Hoopoe
FBI, 4, 308/1579; SYN, 227/763 and HB, 4, 124/763

Common in Dun near cultivated open country (O); occasionally in garden lawns; New Forest area—nearly throughout, maximum average count in month of November but dominance from February to November in post harvesting and growing crops (W, 49); (George 57) records it as resident but partly migratory.

Family Bucerotidae

194. *Tockus birostris* (Scopoli): Common Grey Hornbill
FBI, 4, 301/1575; SYN, 228/767 and HB, 4, 130/767

Fairly common in the Dun—open forests or cultivated areas with scattered trees (O); New forest area—resident but common in winters and autumn (G, 57) earliest seen in February and latest in September (W, 49).

195. *Antracoceros malabaricus malabaricus* (Gmelin) : Indian Pied Hornbill
FBI, 4, 288/1565; SYN, 230/774 : HB, 4, 140/774

This bird occurs in the Dun; more especially in Siwlaiks (sal forests) but is not common (O).

Order *Piciformes*Family *Capitonidae*

196. *Megalaima virens marshallorum* (Swinhoe) : Great Hill Barbet

FBI, 4, 106/1427; SYN, 232/777 and HB, 4, 147/777

'Common in the well wooded valleys around Mussoorie and beyond Chakrata from 4,000'-8,000' (O); rare winter visitor in New Forest area (G, 57).

197. *Megalima zeylanica caniceps* (Franklin) : Green Barbet

FBI, 4, 110/1430; SYN, 232/780 and HB, 4, 150/780

Very common in the Dun wherever there are big trees and especially in the sal forest (O); common resident in the New Forest area, earliest seen in April and latest in December (W, 49).

198. *Megalaima asiatica asiatica* (Latham) : Blue-throated Barbet

FBI, 4, 116/1436; SYN, 234/788 and HB, 4, 158/788

Common in the lower and outer Himalayas upto 6,000' e.g. below Mussoorie, Rajpur, Kalsi, Thano etc. (O); in New Forest area—resident (G, 57, 62), winter visitant and occasionally on trees (W, 49).

199. *Megalaima haemocephala indica* (Latham) : Crimson-breasted Barbet or Copper-Smith

FBI, 4, 128/1447; SYN, 235/792 and HB, 4, 163/792

is extremely common throughout the Dun, but especially so in Dehra (O); in New Forest area—fairly common resident (G, 57), earliest seen in April and latest in November (max. dominance in November at ripening of crops) (W, 49).

Family *Picidae*

200. *Jynx torquilla* (Linn.) : Wryneck

FBI, 4, 99/1423; SYN, 239/796 and HB, 4, 168/796

'An occasional cold weather visitor to the Dun' (O); rare winter visitor in New Forest area (G, 57), White (49) observed it only in September.

201. *Micropterus brachyurus humei* (Kloss) : Rufous Woodpecker

FBI, 4, 63/1389; SYN, 239/802 and HB, 4, 177/802

'This is a fairly common bird in sal (*Shorea robusta*) forests in the Dun' (O).

202. *Picus squamatus squamatus* (Vigors) : Scallybellied Green Woodpecker

FBI, 4, 7/1337; SYN, 240/807 and HB, 4, 182/807

A common bird in the hills beyond Chakrata and near Mussoorie from 5,000'-8,000' (O).

203. *Picus xanthopygaeus* (J.E. & G.R. Gray) : Little Scalybellied Green Woodpecker
FBI, 4, 10/1339; SYN, 240/808

'Common in the sal (*Shorea robusta*) forests of Dun' (O).

4. *Picus canus* (Gmelin) : Blacknaped Green Woodpecker

FBI, 4, 13/1343; SYN, 241/809 and HB,

'Found in the hill forests upto 8,000' (O).

205. *Picus flavinucha kumaonensis* (Koelz) : Large Yellownaped Woodpecker

FBI, 4, 23/1353; SYN, 242/818 and HB, 4, 190/812

'Occurs in the Dun, in the lower Himalayas, as far west as Rajpur (below Mussoorie) — not common (O).

206. *Picus chloropus sinlae* (Meinerzhagen) : Small Yellownaped Woodpecker

FBI, 4, 17/1346; SYN, 242/814 and HB, 4, 192/814

Type locality of the species is Dehra Dun but since first description (in year 1924), it has not been observed in the area. Hence it would be of worthwhile scientific interest to collect a few specimens from Dehra Dun and deposit them in the National Zoological collections, besides collection of field data on its present status in type locality and data on breeding etc.

207. *Dinopium benghalense* (Linn.) : Lesser Goldenbacked Woodpecker

FBI, 4, 67/1394; SYN, 243/818-19

'Very common in the Dun, in all kinds of forests' (O). George (57) in New Forest area observed—'resident but not common'.

208. *Hypopicus hyperythrus hyperythrus* (Vigors) : Rufous-bellied Woodpecker or Sapsucker

FBI, 4, 31/1359; SYN, 247/833 and HB, 4, 211/833

'Occurs but is not common in the hills north of Chakrata between 6,000'-8,000' (O).

209. *Dendrocopos himalayensis himalayensis* (Jardine and Selby) : Himalayan Pied Woodpecker

FBI, 4, 32/1360; SYN, 249/837

This is quite the commonest woodpecker of the hill forests—Oak (*Quercus* spp.) and fir (*Abies* spp), in the hills about and beyond Mussoorie and Chakrata. It is common from 6,000'-9,000' but is found both lower and higher than this (O).

210. *Dendrocopos auriceps auriceps* (Vigors) : Brown-fronted Pied Woodpecker

FBI, 4, 42/1370; SYN, 250/842

'This is also a common bird, smaller than the previous, found in more open oak and mixed forests at lower elevations generally 4,000'-7,000' (O); in New Forest area—resident (G, 57).

211. *Dendrocopos canicapillus mitchelli* (Malherbe) : Grey-crowned Pigmy Woodpecker
FBI, 4, 50/1377; SYN, 252/848
Might be occurring in our area.

212. *Dendrocopos nanus nanus* (Vigors) : The Himalayan Pigmy Woodpecker
FBI, 4, ?/?; SYN, 256/861

Occurs in Dehra Dun and in the lower hills upto about 3,000'. A bird of open forest or scattered trees to cultivation (O).

213. *Chrysocolaptes lucidus guttaeristatus* (Tickell) : Larger Golden Woodpecker
FBI, 4, 80/1405; SYN, 256/861

'Occurs in the sal (*S. robusta*) forests of the Dun, but is not so numerous as the *Dendrocopos benghalensis* which has been observed throughout the year, earliest seen in January (W, 49); in New Forest—rare, seen only in April (W, 49).

References

1. Ali, Salim & Ripley, S.D. (1969). Hand Book of The Birds of India and Pakistan, Vols. 3 & 4. Oxford University Press.
2. Baker, Stuart, E.C. (1928). Fauna of British India, Vol. 5; *ibid*, Vol. 6; Taylor & Francis, London.
3. Bhatnagar, R.K. & Mishra, Pradeep. (1971). Revised Synopsis of the Birds of India & Adjacent Hills—Pt. 1. Cheetal Vol. 14, No. 2 (September 1971), pp. 41-58. (Journal of the Wild Life Preservation Society of India, 7-A, Astley Hall, Dehra Dun, India).
4. Dharamkumarsinghji, K.S. (1956). Journal Bombay Natural History Society, Vol. 54, p. 185.
5. Osman, S.M. (1971). Cheetal (Journal of The Wild Life Preservation Society of India). pp. 38-39.
6. (Mrs.) White, M.D. (1949). A Bird Count in Dehra Dun. Journal of the Bombay Natural History Society. Vol. 48 (3); pp. 570-576.

N.B.—Other references remain the same as in Part I of the paper.

Rehabilitation and the Little Leopard

BY

ARJAN SINGH

While ecologists and ethologists are still fighting their last ditch battles and while international bodies are expressing grave concern for the future of the symbolic tiger and all its six subspecies, we are in danger of overlooking a perhaps more poignant and impending tragedy in the yet local disappearance of that most beautiful of all cats—the leopard.

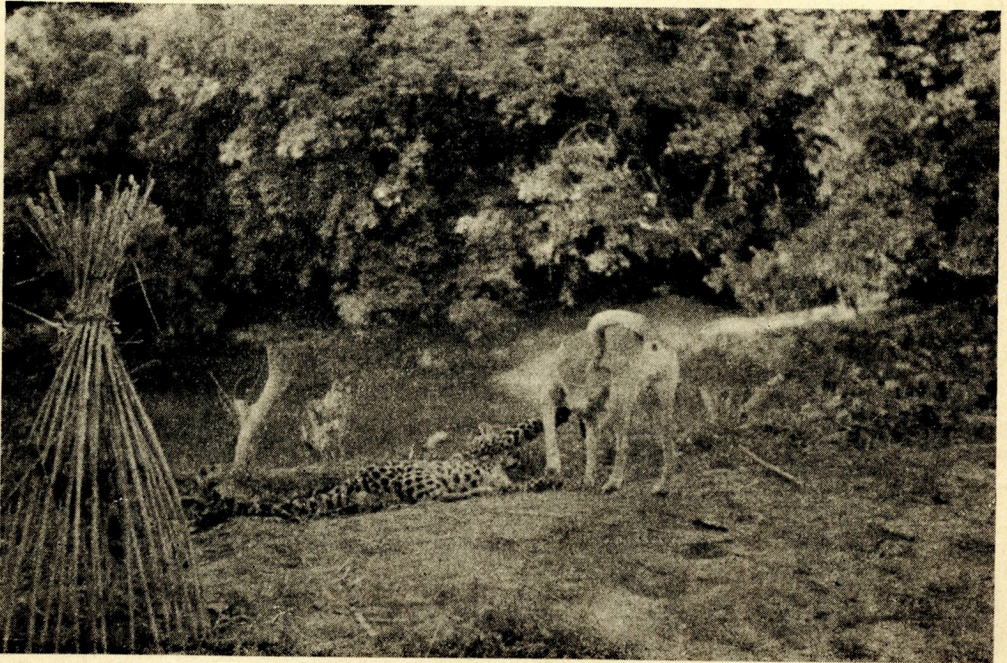
During the first half of the century and especially during the earlier years, it was looked upon as the most adaptable of all the carnivores. From the outskirts of human habitation to the depth of the jungle, the leopard ranged in varying physical dimensions. The small, dark specimens, long of tail, and not much bigger than large cats were an ultimate transition of the same subspecies. They not only shared the range with the tiger but bore comparison in size with young tigresses, which killed large prey with the same dexterity as the larger felines and to which the denizens of the woods paid a similar vocal homage. They were so prolific that they were regarded as vermin—though one hesitates to think that so beautiful a creation deserves so demeaning a sobriquet,—and a bounty was on their head. Many a master took his favourite dog for a walk once too often. Dogs were taken from under beds, from the end of leashes, and from the edge of human habitation, with a familiarity that betokened contempt.

The disappearance of leopards has been nothing short of cataclysmic and the last few years have rung down the curtain. Eight years ago 'Tiger Haven' had three resident leopards in the forest immediately behind the house. They regularly crossed a bridge over a small stream in front of where I live, to hunt cheetal during the absence of the resident tigers, for they avoid the proximity of the larger predator, and often passed within twenty yards of where I slept in the open. They are now no more, and the cause seems obvious. Disturbance, degradation and destruction of habitat has had a disastrous impact on other wild species also. Loss of prey species has affected the tiger, but that nocturnal and secretive animal still holds out when the extroverted and adaptable leopard has disappeared. The reason is a more cogent one and cannot be other than that villain of the piece, the fur trade. The boom in the skin traffic has been phenomenal while it lasted, and though well known international traders have now agreed to discontinue the processing of exotic furs, the countries of their origin are still eager and hopeful suppliers. A matched Somali leopard skin coat reputedly sold for between fifteen and twenty thousand dollars, and the glamour girls of the world appeared in skins other than their own.

All who could, tried to cash in on this poisonous fashion trend, and the end result has been disastrous. In a back street of Calcutta I was offered a regular monthly supply of



Spotted deer watching for danger.



A unique fraternity.

200 leopard skins and as a token of their good faith they produced a bail of 25 uncured skins. Patches of spotted fur peeped furtively out of other bundles, and it was explained that this was reject material. The atmosphere was fetid and revolting and made one long for escape to the great green vault of nature from the lowering roof of concrete, to the wind sighing in the trees, in lieu of the rank and noisome smell of stale humanity and rotting fur, and the song of the birds in place of the ingratiating tones by which man endeavours to swindle his fellows.

The time is not far off when we will have to accept the principle of reintroduction of the great carnivores in depleted areas from hand-reared stock. The hope of rehabilitation from a small nucleus of wild animals is altogether too risky as it is well known that the point of no return comes a long time before the last individual disappears. Spoilation of the habitat means that this may still further inhibit the lengthy and doubtful processes which allows us to accept a mere 50% as the maximum survival rate for the genus in the wild state. The greater birth survival potential of zoo animals will have to be exploited. The main causes for slow proliferation in the wild is the period of long dependence of the cubs, the inadequacies of the mother, the liability of the cubs to lung and intestinal ailments, and the uncertainty of food supplies leading to abortion, low conception, and infant mortality; nature's curbs on population which man in his wisdom has out-grown. The breeding potential in zoos is infinitely greater, and seven foetuses have been found in a dead tigress. The tigress can become receptive immediately after removal of the cubs and mortality can be controlled by proper diet and care. A nucleus stock can be built up for rehabilitation to the wild state if only man would realise that he has no right to destroy what he cannot create, but the realization is slow in coming and the Lucknow Zoo has four male leopards while the Delhi Zoo has four females who languish in enforced virginity.

The difficulties of rehabilitation are going to be great, let there be no mistake. Hitherto the world has read of the planned return to the feral state of pride animals like the lion and the cheetah where the main problem is acceptance by a wild group of an individual which has been reared in captivity. How difficult this can prove, may be seen at the release of hand reared animals only to be mobbed, and sometimes even killed by its wild counterparts. Prolonged human contact appears as a handicap to wild members as a physically retarded animal is equally liable to attack, though here again the higher mammals like the monkeys, the elephants and the bears are often excessively solicitous of hurt members. Once acceptance takes place the rest is plain sailing, as killing of prey is done by other pride members and a gradual indoctrination in techniques together with a natural instinct will soon establish a wild base. The case of highly individual animals like the tiger and the leopard is going to present a different aspect. Firstly it will have to be seen how the animal reared in the security of regular meals will react to the feast or famine regimen which is the lot of its wild counterpart. Changes in environ produce changes even in

human behaviour and is much more marked in animals, but in the cats, it will have to be regulated by the ability to kill efficiently. Cases have taken place where a thoughtless release has led to starvation or violent contact with man, and the rehabilitation process will have to be a patient and sympathetic introduction which might never succeed, but may present the triumph of a return to nature of part of so much that we have forcibly taken away.

I first learned of the little leopard which had arrived in Calcutta and had been taken into the protective custody of Anne Wright a trustee of the World Wildlife Fund. According to legend a pair had been found abandoned on the roadside near the Bihar State border. The cause of the desertion by the mother is unknown, but the cubs were brought to Calcutta in a small handbag. The female sadly died en route. The male christened "Cheetla" was reared on powdered milk, which was gradually replaced by finely scraped and then chopped meat supplemented by calcium and ABDEC vitamin drops. There he spent the first four months of his life and developed from a fluffy kitten into a little leopard, where he made friends with the cat and dogs, learnt how to climb trees, chased the pet mongoose, and occasionally swept the contents of the tea table, on to the floor with his long tail. Realisation however, was there that he could not much longer live amidst the rat scramble of Calcutta and Anne very kindly thought of 'Tiger Haven' as his future home.

On the 19th October 1971, I motored about 90 miles, where we would stay the night with some friends, before making the final stage of the return journey. Anne duly arrived, accompanied by her pretty daughter Belinda, who had devotedly cared for the little animal during these first critical months of his existence. They told me how he was the cynosure of all eyes during the long train journey, often questioned by the ignorant onlookers as to his man-eating propensities and convinced by the scratches they bore, of the intrepidity of these daring females. He was cross and complaining on the journey but "Blue" duly consoled him by holding him to look out of the window and indulging in a long commentary on the various activities going on along the fleeting countryside, and he only disgraced himself once ! I was meanwhile pondering on the minor problem of his introduction to the other small members of my transitional animal kingdom. There was Eelie, the nondescript bitch who had recently produced seven pups, and two small rhesus monkeys who had arrived as tiny little waifs and had stayed on. I was rather intrigued to see how they would react to the "traditional enemy" if indeed there does exist such a relationship in nature.

The rhesus monkeys occupy an ignoble position in present day India in spite of the fact that Hindu mythology holds that they are descended from the monkey God, Hanuman, who enabled Rama to rescue Sita, his wife from Ceylon where she had been abducted by the demon Ravana. They hang about temples and grain shops of India, scruffy and deformed, half human figures stealing and pilfering from pilgrims and merchants alike, often mobbing and biting way-farers before plundering their possessions. Instead of acquiring nobility

from their human contacts they have inherited cupidity and stealth ! In the countryside they eat the newly planted seeds of farmers, pull up the emergent shoots for the hell of it, and feed extensively on the ripening maize crops. Governmental statistics accord them the honour of bracketing them with rats as prime contributors to the food grain shortage. Even in the forests they prefer to live in the proximity of the human beings, on sugarcane and other crops, seemingly impervious to punitive action except to make them even more cunning in their depredations. A few years ago it was discovered that they could be earners of foreign exchange by being sent to foreign countries for the extraction of serum, and the heat was on, when people from the town gravitated as monkey catchers. I recall seeing these pathetic little half human faces peering miserably out of narrow wicker-work baskets at railway stations, and being relieved to think that at last a use had been found for this bane of the farmers life. But all this has now changed. Changed with the arrival of two little waifs who had lost their mother, and have accepted human kindness while retaining their freedom. And now when one plucks a blooming "Rose of Sharon" and looks in triumphant glee at me before racing up a tree I think of Kipling's lines:—

His hide was very mangy, his face was very red,
and ever and anon, he scratched with energy his head
His manners were not always nice but how my spirit cried
to be an artless "bandar" loose upon the mountain side.

About two years ago there arrived at one of my farms two very small monkeys. Their little heads were not much larger than Ping Pong balls and by the way they adopted the precincts it appeared that they had lost their mother due to an accident. They lived on the many trees surrounding the house, existing on seasonal buds and whatever the garden had to offer. For the first year they were very reclusive but gradually they took to riding out to pasture on the backs of the buffaloes. They started making the first advances to humans and while remaining in the trees they would come closer to see what liberties they dared take with someone who looked like themselves but was so much bigger. They were soon being fed by the resident labour and by the second year had become tame in that while living in the trees they would accept food from the people they had come to know. By the out-break of the rains, when I generally come to stay at the Farm of their adoption they had started coming into the verandah in time for my morning and evening tea. Both were females and while one, a pretty little thing with a natural blue above her eyelids which so many girls have to acquire artificially had become known as Elizabeth Taylor, the other had a long lugubrious face and always looked as if she was pondering some abstruse problem until she made a lightening dart and scampered up a tree with my spectacles, was named Sister Cuptara after a fancied resemblance to a nurse who looked after my uncle.

Eelie soon became their playmate and while Guptara sat on her back Elizabeth Taylor used to seize her long tail and go round and round in the manner of an Olympic hammer

thrower. They would leap ferociously at her from every conceivable eminence and soon had her completely demoralised though she always returned for more. At tea they sat on a chair and were fed with pieces of unleavened bread until one of them thought the other was getting more than her fair share when she would make a grab at her sister's piece. However, they soon settled down amicably and would sit peering through the wire netting into the room from where the tea came, uttering urgent cries. They did not relish Bhagwan Piari—the elephant but would try to intimidate her from under the chair, when she came to be fed. Sister Guptara was slightly larger and always took the initiative. She did so one fatal day when she clambered up an electric pole on to a step down transformer from 11,000 volts, in spite of the protective thorns I had tied round the base. She was hurled to some soggy wheat trash and lay as dead. After a little while, however, she tried to crawl slowly away with one arm hanging limp. Elizabeth Taylor immediately became very protective and sat with her arms around the afflicted little monkey all night while she moaned in pain. The flesh was burnt away to the bone but as it slowly healed, her growth became retarded and now the other is larger. She can now lean her hand on the ground and one hopes it will heal further. Elizabeth Taylor continues to be protective and makes grimaces at any fancied slight to her sister. They sat on Anne Wright's knees and helped her finish her toast, but when Belinda pulled Guptara's tail they immediately pulled a few faces at her. They delight at looking at themselves in the mirror, peer enquiringly into empty beer bottles and search for fleas in one's hair with assiduous dedication. They live in the trees and descend for their meals and with them comes the freedom and freshness of space.

The arrival of the little leopard was greeted with a display of curiosity but no obvious alarm. The monkeys abandoned their food to stand bi-pedally gazing with intent curiosity at this strange and colourful arrival. Eelie was more hostile and tried repeatedly to nip the cub in the rear, but they soon settled down, and while the dog moves discreetly away, the monkeys occasionally tried to be friendly. Sister Guptara placed her hand in a benevolent gesture on his head and little "Cheetla" promptly attempted to swot her with his oversize paws. Elizabeth Taylor tried pulling his tail and was chased up a tree where of course the cub was completely outclassed. However, they will probably soon be friends and show none of the alarm which was displayed by a wild entellus (Langur) who coughed his warning from the topmost branches of a sal tree, when he caught sight of the yet small spotted killer.

Time alone will tell whether man having interfered in the lives of individual hunters can persuade them to return to their proper environ. Whether having accustomed them to regular meals, they will opt for the feast and famine existence of the wild hunter, whether they will exchange an assured existence for the freedom of the forest and if they do, what tenuous relation will they retain with their erstwhile masters. A Mammal does not have loyalties, only instincts, and in the individualistic types gregarious instincts are far less

developed. In pride animals seasonal manifestations have a larger locating value, and though it might make the exercise simpler if it were possible to locate a wild female leopard the present depleted state may on the other hand require the attempted release of a pair. Whatever the future holds for little "Cheetla" it is fraught with interest. He does not know it and keeps a little squeak of welcome for the only foster parents he has ever known.

DUCKS NEED PRIVACY

Crowded ducks die. Michigan State University pathologists report that ducks, like people, need space to withdraw and be by themselves occasionally. If ducks are not allowed to do this, their behavior deteriorates and physical symptoms appear.

Social stresses can cause psychosomatic diseases and can cause formation of wax like deposits in crowded ducks. This results in frequent cases of amyloidosis. The waxy protien accumulates in internal organs and eventually kills the birds.

The M.S.U. scientists say that disease probably takes its toll of wildlife. Crowded wildlife refuge areas were cited as possible targets for amyloidosis. Duck breeding farms also have considerable damage. Crowding appears to cause this disease in ducks much as crowding and frustration appear to cause ulcers in people.

Of special interest was the discovery that one bird in flock showed no amyloid deposits. It is suspected that these healthy birds were dominant in flocks and therefore were under less social stresses. Another possibility would be that disease free ducks are genetically different or else just easy going 'drop-outs'.

Ducks studied in Zoo, developed amyloidosis late in 6.4 years average life span. The research study has disproved the previous theory that aging caused the waxy deposits. At the end of the M.S.U. investigation, no duck was more than 264 days old.

(Conservationist)

नाग (कोबरा) का निरीक्षण

लेखक—हरीप्रकाश अग्रवाल,

भारतीय प्राणी सर्वेक्षण विभाग, सोलन।

रेंगने वाले जन्तुओं में बहुत अधिक विविधता पाई जाती है, जिसमें विविध प्रकार के जन्तुओं का समावेश है। सर्पों का वर्ग उनमें से एक है। सर्पों का वर्ग जिसे सरपेनटिस या औफीडिया भी कहते हैं, स्क्वेमेटा खण्ड के अन्तर्गत स्थान रखता है। इन टाँग रहित रेंगने वाले जन्तुओं के चार मुख्य कुल हैं—बोआईडी, कोल्यूब्राईडी, वाईपेराईडी और एलापाईडी। इन विभिन्न कुलों के अन्तर्गत सर्पों की २ हजार से भी अधिक जातियाँ उपलब्ध हैं जो कि सभी प्रकार के स्थानों व वातावरण में निवास करने में कुशल हैं।

कोबरा के विषय में कुछ वर्णन करने से पूर्व यह आवश्यक है कि इन जन्तुओं के मुख्य लक्षणों पर भी कुछ प्रकाश डाला जाए; इनकी विवेचना इस प्रकार है—इन जन्तुओं में दोनों शंखास्थि का लोप है; जम्बिका, तालु और टैरीगाइड्स सरलता पूर्वक घूमती हैं तथा हनुसन्धिका मजबूती से स्ट्रेप्टोस्टाइलिक रहती है; जम्बिका की शाखायें शक्तिशाली व लचकदार अस्थि बन्धों द्वारा जुड़ी रहती हैं। अस्थियों की इन विशेषताओं के फलस्वरूप सर्पों के मुँह में काफी चौड़ा व वृहत् स्थान बन जाता है। इस कारण से अन्य रेंगने वाले जन्तुओं की अपेक्षा सर्पों में भोजन ग्रहण करने की विधि बहुत विस्तृत व सुगठित है व वह अपने से भी अधिक बड़े जन्तुओं का भक्षण करने में समर्थ है। उरोस्थि व उपउरोस्थि का अभाव रहता है; पलक स्थिर रहते हैं; कर्ण पट्ट व निक्टेटिंग झिल्ली अनुपस्थित रहती है। जो वास्तव में विपरीत सर्प हैं उनमें एक जोड़ा विष की ग्रन्थियों का होता है जो कि जम्बिका के ऊपर स्थित एक विशेष प्रकार के गद्देदार दाँत में खुलती है, जिन्हें फेंस या विष-दन्त कहते हैं।

प्रकृति की रचना व सृष्टि भी अनुपम है: सर्पों में टाँगों के लोप हो जाने से उनकी लम्बाई में वृद्धि हो सकी; सर्पगति ने पैरों के कार्य का स्थान ग्रहण कर लिया। सर्प के शरीर की रचना अपने शिकार के चारों ओर लिपटकर दबाकर मारने में समर्थ है: साथ ही वृक्ष पर चढ़ने में भी समर्थ है—उस समय उसका शरीर एक टहनी या शाखा के समान प्रतीत होता है। टाँगों की अनुपस्थिति व शरीर के लम्बे व पतले होने के फलस्वरूप वह छिद्र आदि में भी प्रवेश करने में समर्थ है।

वैसे तो सभी सर्पों का बहुत महत्व है परन्तु नाग (कोबरा) एक अनुपम व विशेष महत्व रखता है। इसकी भारत में केवल दो जातियाँ ही उपलब्ध हैं—(१) नाजा नाजा, (२) नाजा हुन्नाह। नाजा शब्द संस्कृत के “नागा” शब्द से व्युत्पन्न हुआ है। नाग या कोबरा को भारतीय भाषा में नागराज, कालानाग एवं शेषनाग के नाम से भी सम्बोधित करते हैं। नाग बहुत ही हानिकारक या खतरनाक काले या गेहूँआ रंग का सर्प है जो कि एफ्रो-एशियन देशों में ही मिलते हैं। इस रेंगने वाले जन्तु का मुख्य लक्षण शिरोवेष्टम (हुड) है जिसको कि वह स्वेच्छानुसार फैला और चौड़ा सकता है। शिरोवेष्टम ग्रीवा की बड़ी पसलियों को उठाने से बन जाता है। नाग (कोबरा) की तीन उप-जातियाँ शिरोवेष्टम के ऊपर अंकित चिह्नों द्वारा पहचानी जा सकती हैं, जो इस प्रकार हैं—

- (अ) वाईनोसिलेट या चश्मेदार—सम्पूर्ण भारत के प्रायद्वीप में पाया जाता है।
 (ब) मोनोसिलेट या O—आकार—पश्चिमी बंगाल से लेकर चीन तक पाया जाता है।
 (स) नोनोसिलेट या बाधित किस्म—भारत के उत्तर-पश्चिम से लेकर ट्रान्सकेस्पिया तक मिलती है।

भारतीय कोबरा की विभिन्न जातियों की व्याख्या या परिभाषा के लिये वैज्ञानिकों ने कई प्रयास किये, परन्तु कोई भी पूर्ण सफल नहीं हुआ। बौलेंगर ने भौगोलिक वितरण को ध्यान में नहीं रखा। वाल ने स्केलों की गणना के आधार पर ऐशियाई जाति को पाँच जातियों में विभक्त कर दिया। यह देखा गया कि सबसे अधिक शरीर के स्केलों की संख्या सीलोन में पाये जाने वाले नाग में होती है तथा प्रायद्वीपीय भारत के उत्तर में पाये जाने वाली जाति के स्केलों की संख्या कम होती जाती है। उत्तरी भारत से चीन तक पाई जाने वाली जाति में बहुत कम अंतर है। मलय भाग में पाये जाने वाले कोबरा में स्केलों की संख्या सबसे कम होती है।

यह सर्वविदित है कि एक ही जिले में पाये जाने वाले विभिन्न नागों के रंगों में भी कितनी अधिक विविधता पाई जाती है। छुटपन से लेकर परिपक्व अवस्था तक अत्यन्त महत्वपूर्ण परिवर्तन होते हैं। जैसे जैसे अवस्था बढ़ती है बहुत से चिह्न व निशान अवश्य होते जाते हैं। केवल रंग के आधार पर विभिन्न उप-जातियों की व्याख्या करना व्यर्थ का विषय है। शिरोवेष्टम का ढंग सीमित रहने के आधार पर निश्चित रूप से प्ररूप-जातियों में भेद किया जा सकता है और उनको भौगोलिक वितरण से भी संबन्धित किया जा सकता है।

कोबरा या नाग किसी भी प्रकार के वातावरण में पाया जा सकता है। यह जल को पसन्द करता है। यह विश्वास किया जाता है कि यह आक्रमणशील सर्प नहीं है, परन्तु ऐसा दिन के समय ही देखा जाता है; रात्रि के समय इसकी मनोदशा या चित्तवृत्ति बिल्कुल भिन्न या विपरीत होती है। एकटन और नौलिस ने भी इस विचारधारा का समर्थन किया है। यह दिन के समय अधिकतर मुँह बन्द रखता है जबकि रात्रि के समय इसकी दृष्टि भी तीव्र होती है व इसका आक्रमण पकड़ने के उद्देश्य से होता है। इसको भोजन की खोज संध्या समय होती है। यह मुख्यतः चूहे, मेंढक, चिड़िया, अंडे व सर्पों का भक्षण करता है। छोटा नाग अधिक उम्र वाले नाग की अपेक्षा अधिक उत्तेजित व आक्रमणकारी होते हैं। जब नाग आक्रमण करना चाहता है तो इसका अग्र शरीर पूरे शरीर की एक चौथाई से एक तिहाई लम्बाई तक खड़ा हो जाता है।

इनमें मैथुन क्रिया जनवरी-फरवरी माह में होती है एवं मई मास में अंडे देते हैं, परन्तु अंडे देने का कार्य कई माह तक भी चलता है। इस बारे में बहुत से प्रमाण मिलते हैं कि मैथुन के समय से लेकर नये सर्पों के जन्म तक नर व मादा साथ साथ रहते हैं तथा नर-अंडों की सुरक्षा में भी मदद करते हैं। उद्भवन अवधि ६९ से ८४ दिन तक होती है। अंडों की संख्या १० से २० तक रहती है, परन्तु ४५ अंडे तक भी देखे गये हैं, जिनमें ३६ उर्वर थे। कोबरा (नाग) के जन्म के पश्चात्, प्रथम वर्ष में इनमें तीव्रता से वृद्धि होती है। निकोलसन के निरीक्षण का वाल ने समर्थन करते हुये कहा है कि नवजात कोबरा (नाग) जिसकी लम्बाई जुलाई मास में १२ इंच थी, आगामी जुलाई मास तक इसकी लम्बाई २ फीट ६ इंच हो गई; तत्पश्चात् वृद्धि में धीमापन हो गया व चौथे वर्ष तक उसकी लम्बाई ४' १०" हो गई।

कोबरा (नाग) की विभिन्न जातियों में भारत की (नाजा हन्नाह) हमदयाद जाति सबसे बड़ी है जिसे किंग कोबरा या बड़ा नाग भी कहते हैं। इसकी लम्बाई १६ फीट से अधिक तक मापी गई है। यह मुख्यतः दूसरे सर्पों का ही भक्षण करता है इसलिये इसे किंग कोबरा की संज्ञा दी जाती है।

किंग कोबरा अन्य साधारण कोबरा से निम्न लक्षणों द्वारा भेद रखता है —

- (अ) वेज शील्ड की अनुपस्थिति;
- (ब) अवस्कर के समीप दुम के शील्ड विभक्त नहीं होते वरन् दुम के सिरे की ओर विभक्त होते हैं;
- (स) सिर पर भित्तिकास्थि के पीछे २ बड़े अनुकपाल शील्ड होते हैं;
- (द) शिरोवेष्टम पर केवल एक ही अंडाकार चिह्न होता है या कोई चिह्न नहीं होता।

अल्प व्यस्क किंग कोबरा का पृष्ठ भाग काला होता है जिस पर तंग श्वेत-नीले से रंग की आड़ी धारियाँ रहती हैं जोकि फीते के आकार की होती हैं; शरीर के दायें बायें सिरों पर यह फैल जाती हैं। सिर पर चार धारियाँ होती हैं, जिनमें से पीछे वाली दो धारियाँ बहुत से बिन्दुओं के सम्मिश्रण से बनती हैं। निचला भाग श्वेत सा होता है, जिसपर तंग काली या कृष्ण आड़ी धारियाँ रहती हैं। शरीर का पिछला भाग व दुम बहुत अधिक गहरे रंग की होती है। जैसे जैसे अवस्था बढ़ती जाती है, निशान व चिह्न भी अदृश्य होने जाते हैं। शिर व शरीर के अग्रिम भाग पर चिह्न लगभग बिल्कुल समाप्त हो जाते हैं जिसके परिणाम स्वरूप रंग कृष्ण सा हो जाता है। शरीर के पिछले भाग पर धारियों के चिह्न अवश्य रहते हैं।

यह जाति भारत प्रायद्वीप से लेकर हिमालय तक सम्पूर्ण भारत, चीन, बर्मा, मलय प्रायद्वीप और द्वीप समूह तक फिलीपाइन टापू में पाई जाती है। बाल के कथनानुसार यह घने जंगलों में बहुतायत में वास करते हैं जबकि स्याम में खुले मैदानों में रहते हैं। यह जल पसन्द करते हैं व वृक्षों पर सरलता से चढ़ जाते हैं तथा दिन के समय अधिक क्रियाशील रहते हैं।

किंग कोबरा ही अपने वर्ग का एक ऐसा जन्तु है जो कि अपना घोंसला स्वयं बनाता है। इसका घोंसला बाहर से देखने पर सड़ी गली पत्तियों का एक ढेर सा प्रतीत होता है, जिसकी ओर कोई ध्यान आकर्षित नहीं होता, परन्तु यह महत्वपूर्ण बात है कि इसके घोंसले में दो कक्ष या कमरे होते हैं—नीचे वाला अंडों के लिये जो ऊपर वाले से पूर्णतया बन्द रहता है तथा जिसमें मादा अंडों की सुरक्षा के लिये रहती है। अप्रैल से जून माह तक इन घोंसलों में अंडे मिलते हैं। नवजात किंग कोबरा की लम्बाई ५०० से ५३० मिलीमीटर तक होती है।

यह बहुत ही दिलचस्प बात है कि अंडे में उपस्थित नाग में भी अपना शिरोवेष्टम फैलाने की क्षमता व स्वभाव पूर्ण रूप से विकसित होता है। अंडे से निकलते समय जबकि कोबरा का केवल सिर एवं अग्रभाग ही अंडे से बाहर होता है तो वह भी युवा की भाँति अपना शिरोवेष्टम फैलाकर व खड़े होकर आक्रमण करने का प्रयत्न करता है।

अफ्रीका के छोटे शिरोवेष्टम वाले कोबरों या नागों में अपने विष को कुछ दूरी तक धुंकने की क्षमता होती है। वह ऐसा अपनी ओर बढ़ते हुये जानवर या मनुष्य के चेहरे व नेत्रों पर बहुत ही सही प्रकार से करते हैं। विष के नेत्रों पर गिरने से बहुत ही जलन व पीड़ा होती है व कभी कभी इसके बहुत भयानक

परिणाम भी निकलते हैं। अमरीकन चिड़ियाघर के वैज्ञानिक डा० सी०एम० बोगर्ट का मत है कि यह विष ग्रन्थियों पर माँस पेशियों के दबाव के कारण निकला है तथा तरल विष की धारा विष-दन्त के संकुचित व आगे की ओर खुले हुये सिर के द्वारा निकलती है।

मनुष्य कोबरा (नाग) को बहुत ही भयानक जन्तु समझता है। इसका समर्थन किपलिंग की कथा रिक्की-टिक्की-टावी में भी मिलता है जिसमें कोबरा से मनुष्य के काटने का भय अत्यधिक विस्तार से वर्णन किया गया है; यह कहानी कोबरा और नेवला की लड़ाई एवं मनुष्य और कोबरा के वैमनस्य से सम्बन्ध रखती है। परन्तु जैसा कि लोक वार्ता से ज्ञात होता है कि यह कहानी तथ्यों व तथ्यों की भ्रान्त व्याख्या पर आधारित है।

पूर्वी देशों में सपेरों के लिये कोबरा एक व्यापार का साधन है, जो उनका खेल प्रदर्शित करके जीविका निर्वाह करते हैं। यह विचारणीय विषय है कि सपेरा कोबरा (नाग) को ही क्यों अधिकतर खेल प्रदर्शन के लिये चुनता है? इसका मुख्य कारण यह है कि जन-साधारण की यह धारणा है कि यह जन्तु बहुत ही भयानक है: वस्तुतः मनोवैज्ञानिक दृष्टि से भयानक सर्प को सघते या वशीभूत होने पर देखने वालों को भावविह्वल कर देता है।

भारत या ईस्ट इन्डोज की अपेक्षा अफ्रीका में कोबरा की और भी बहुत सी अन्य जातियाँ मिलती हैं। अफ्रीकन कोबरा (नाग) की सबसे प्रसिद्ध जाति ईजिपशियन आस्प है; वह नाग जिसके द्वारा क्लियोपेट्रा ने आत्म हत्या कर ली।

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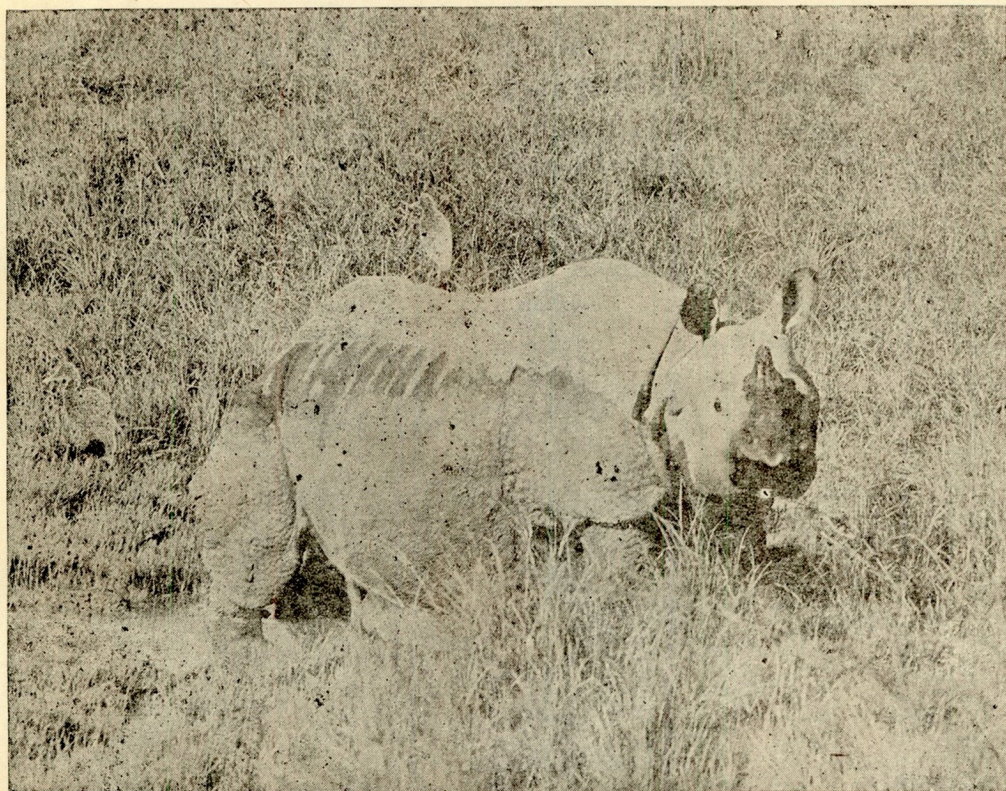
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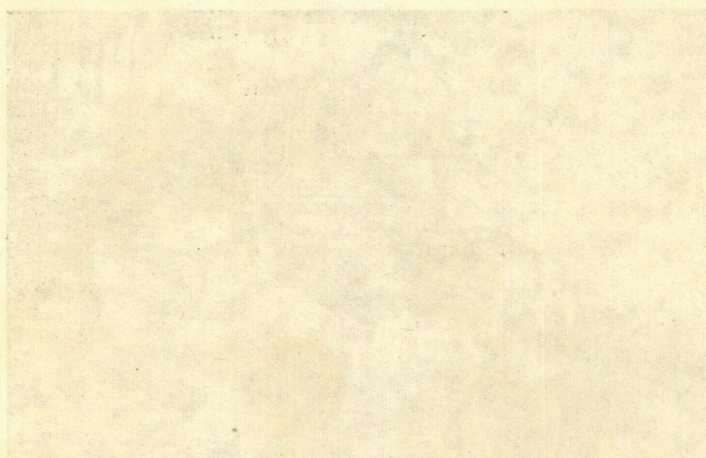
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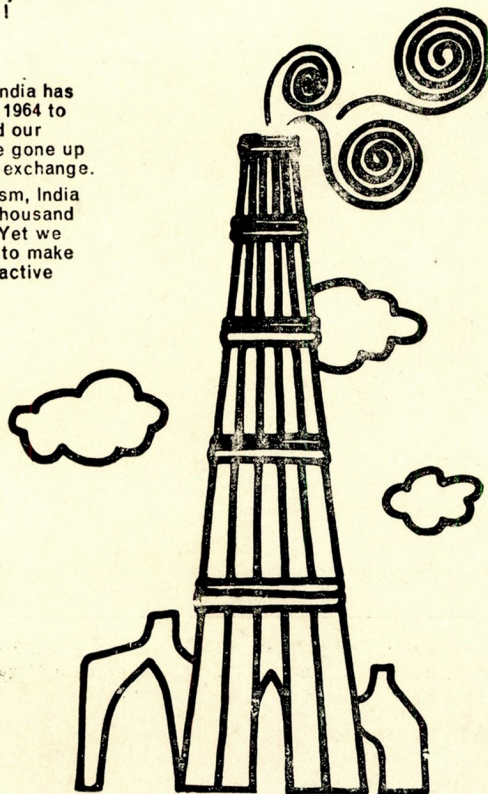
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